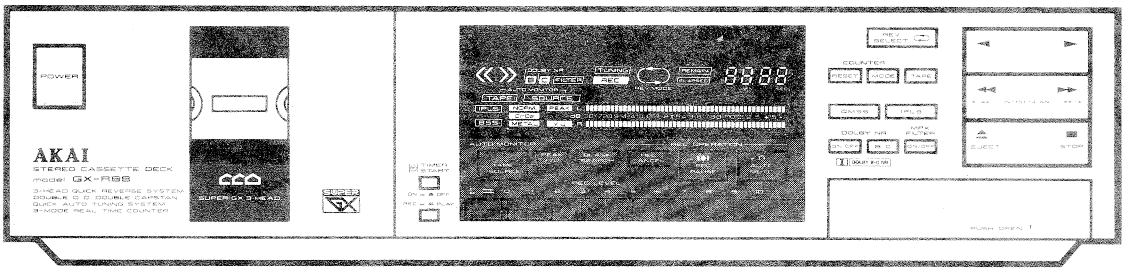
AKAI SERVICE MANUAL


POWER
AKAI
STEREO CASSETTE DECK
model GX-R88
3-HEAD QUICK REVERSE SYSTEM
DOUBLE D.D. DOUBLE CAPSTAN
QUICK AUTO TUNING SYSTEM
3-MODE REAL TIME COUNTER
SUPER GX 3-HEAD
SUPER GX
TIMER START
ON OFF
REC PLAY
DOLBY NR
B C
FILTER
AUTO MONITOR
TAPE
SOURCE
IPLS
BSS
NORM.
CrO2
METAL
PEAK
VU
TUNING
REC
REV MODE
REMAIN
ELAPSED
MIN
SEC
AUTO MONITOR
TAPE SOURCE
PEAK VU
BLANK SEARCH
REC OPERATION
REC CANCEL
REC PAUSE
AUTO MUTE
REC LEVEL
REV SELECT
COUNTER
RESET
MODE
TAPE
QMSS
IPLS
DOLBY NR
ON/OFF
B C
MPX FILTER
ON/OFF
DOLBY B-C NR
EJECT
STOP
PUSH OPEN

STEREO CASSETTE DECK

MODEL GX-R88

ABBREVIATIONS FOR SERVICE MANUAL
MODEL GX-R88

Abbreviation	Explanation	Abbreviation	Explanation
AC	Alternating Current	MICOM	MIcroCOMputer
A/D	Analog/Digital	MIN	MINute
AF	Auto Fader	MPX	Multi PleX
AM	Auto Monitor	NC	Not Connected (No Connection)
AMP	AMPlifier	NFB	Negative Feed Back
AR	Anti Recording	NORM	NORMal
BEF	Band Elimination Filter	NR	Noise Reduction
BSS	Blank Search System	OSC	OSCillator (SOCillation)
CH	CHannel	P	Pulse
CN	Cam Normal	P.B.	Play Back
COMP	COMParator	QMSS	Quick Memory Search System
CR	Cam Reverse	R	Right
CS	Cam Stop	REC	RECord (RECording)
D/A	Digital/Analog	REV	REVerse
DC	Direct Current	ROT	ROTation
DET	DETector	REW	REWind
DISCRI	DISCRIminator	SEC	SECond
EQ	EQualizer	SELE	SELEctor
FF	Fast Forward	SENS	SENSitivity
FLD	FLuorescent Display	SEPP	Single Ended Push Pull
FREQ	FREQuency	SIG	SIGnal
FWD	ForWarD	SPECT	SPECTrum
GND	GrouND	STD	STanDard
H	High	SW	SWitch
HPF	High Pass Filter	SYSCON	SYStem CONtrol
IND	INDicator	TP	Test Point
IPLS	Instant Program Location System	VOL	VOLume
L	Low	VOLT	VOLTage
LED	Light Emitting Diode	VR	Variable Resistor
M	Motor	X'TAL	crysTAL

AKAI
STEREO CASSETTE DECK
GX-R88

STEREO CASSETTE DECK

MODEL GX-R88

SECTION 1 SERVICE MANUAL 3
SECTION 2 PARTS LIST 23

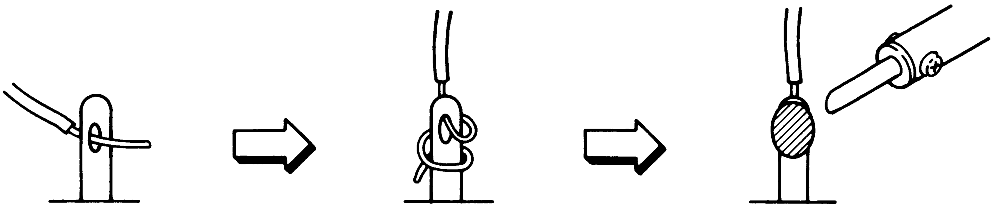
SAFETY INSTRUCTIONS

SAFETY CHECK AFTER SERVICING

Confirm the specified insulation resistance between power cord plug prongs and externally exposed parts of the set is greater than 10 Mohms, but for equipment with external antenna terminals (tuner, receiver, etc.) and is intended for $\boxed{C}$ or $\boxed{A}$, specified insulation resistance should be more than 2.2 Mohms (ground terminals, microphone jacks, headphone jacks. line-in-out jacks etc.)

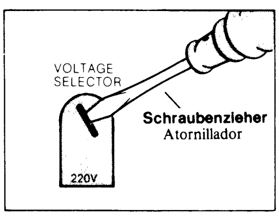
PRECAUTIONS DURING SERVICING

1. Parts identified by the ⚠ symbol parts are critical for safety.
   Replace only with parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation. These must also be replaced only with specified replacements.
   Examples: RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers (Insulating Barriers)
   4) Insulation sheets for transistors
   5) Plastic screws for fixing microswitch (especially in turntable)
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap ends of wires securely about the terminals before soldering.



6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locations.
9. Use care that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

VOLTAGE CONVERSION



Models for Japan, Canada, USA, Europe, UK and Australia are not equipped with this facility. Each machine is preset at the factory according to destination, but some machines can be set to 110V, 120V, 220V or 240V as required. If your machine's voltage can be converted:

1. Disconnect the power cord.
2. Turn the voltage selector located on the Rear panel with a screwdriver until the correct voltage is indicated.

CYCLE CONVERSION

With DC MOTOR, CYCLE CONVERSION is not necessary.

SECTION 1

SERVICE MANUAL

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For basic adjustments, measuring methods, and operating principles, refer to GENERAL TECHNICAL MANUAL.

I. SPECIFICATIONS

TRACK SYSTEM	4 Track 2 channel Stereo System
TAPE	Philips Type Cassette
HEADS	Erase Heads x 2 Super GX Head for recording x 1 Super GX Head for playback x 1
MOTORS	FG Servo D.D. motor for direct capstan drive x 2 DC motor for reel drive x 1 DC motor for mecha drive x 1
WOW & FLUTTER	0.08% WTD (DIN) 0.028% W.RMS ±0.055% W.Peak (EIAJ)
TAPE WINDING TIME	90 sec. Using a C-60 cassette tape
FREQUENCY RESPONSE	Normal: 20 to 18,000 Hz ± 3 dB (EIAJ) CrO_2: 20 to 19,000 Hz ± 3 dB (EIAJ) Metal: 20 to 21,000 Hz ± 3 dB (EIAJ)
S/N RATIO	60 dB (Measured Via tape with peak recording level, Metal Tape) 56 dB (EIAJ): Metal Dolby B-type NR switch ON: Improves up to 5 dB at 1 kHz, 10 dB above 5 kHz Dolby C-type NR switch ON: Improves up to 15 dB at 500 Hz 20 dB at 1 kHz to 10 kHz
HARMONIC DISTORTION	1 kHz, 3rd Harmonic distortion Metal: 0.5% (EIAJ)
INPUT	Line 70 mV (Input Impedance: 47 kohms)
OUTPUT	Line 410 mV at 0VU Required load impedance: 250 ohms Phone: 1.3 mW/8 ohms at 0VU
POWER REQUIREMENTS	100V, 50/60 Hz for Japan 120V, 60 Hz for USA and Canada 220V, 50 Hz for Europe except UK 240V, 50 Hz for UK and Australia 110V/120V/220V/240V, 50/60 Hz switchable for other countries.
POWER CONSUMPTION	J model: 34W
DIMENSIONS	440 (W) x 105 (H) x 372 (D) mm (EIAJ)
WEIGHT	7.6 kg

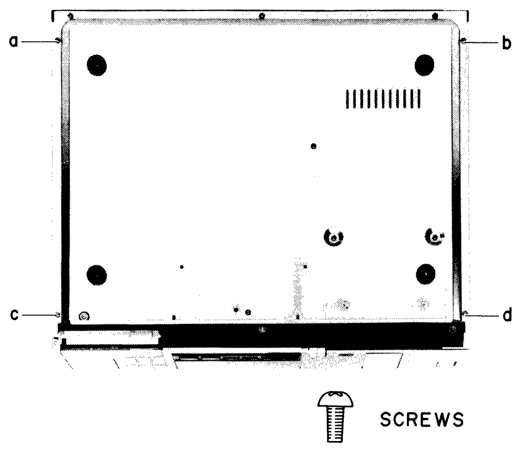
*** For improvement purposes, specification and design are subject to change without notice.**

*** Noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "Dolby" and the double-D symbol are trade marks of Dolby Laboratories Licensing corporation.**

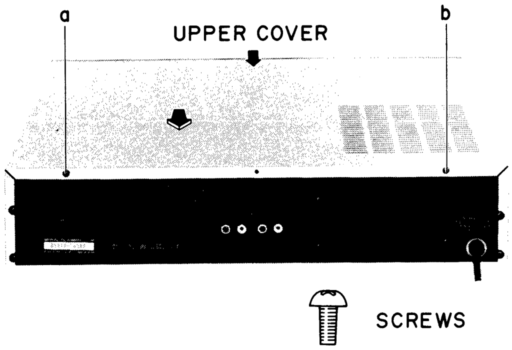
II. DISMANTLING OF UNIT

In case of trouble, etc. necessitating dismantling, please dismantle in the order shown in the photographs. Reassemble in reverse order.

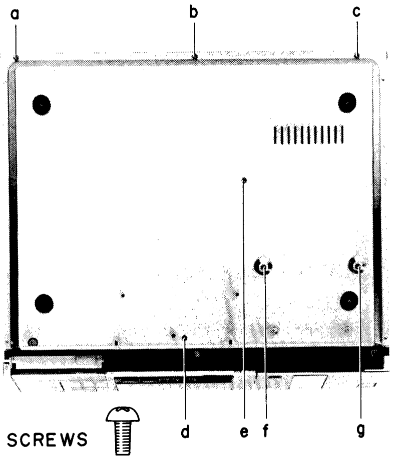
1


a
b
c
d
SCREWS

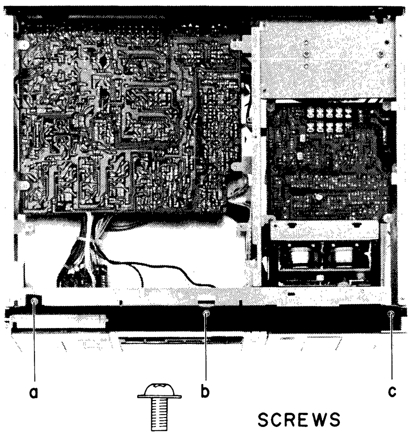
2


a
UPPER COVER
b
SCREWS

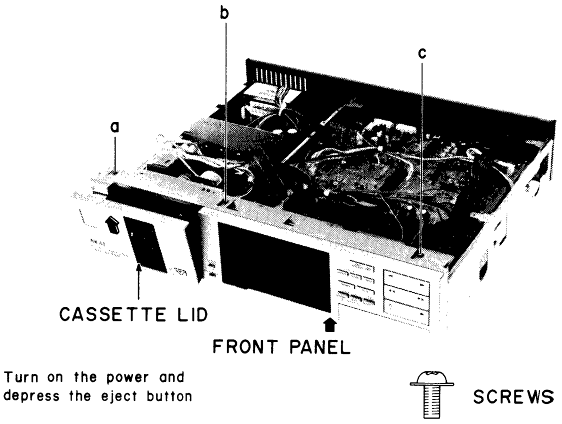
3


a
b
c
SCREWS
d
e
f
g

4

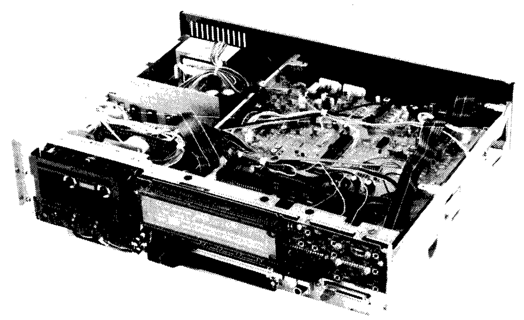


5


b
c
a
CASSETTE LID
FRONT PANEL
SCREWS

Turn on the power and depress the eject button

6



III. CONTROLS

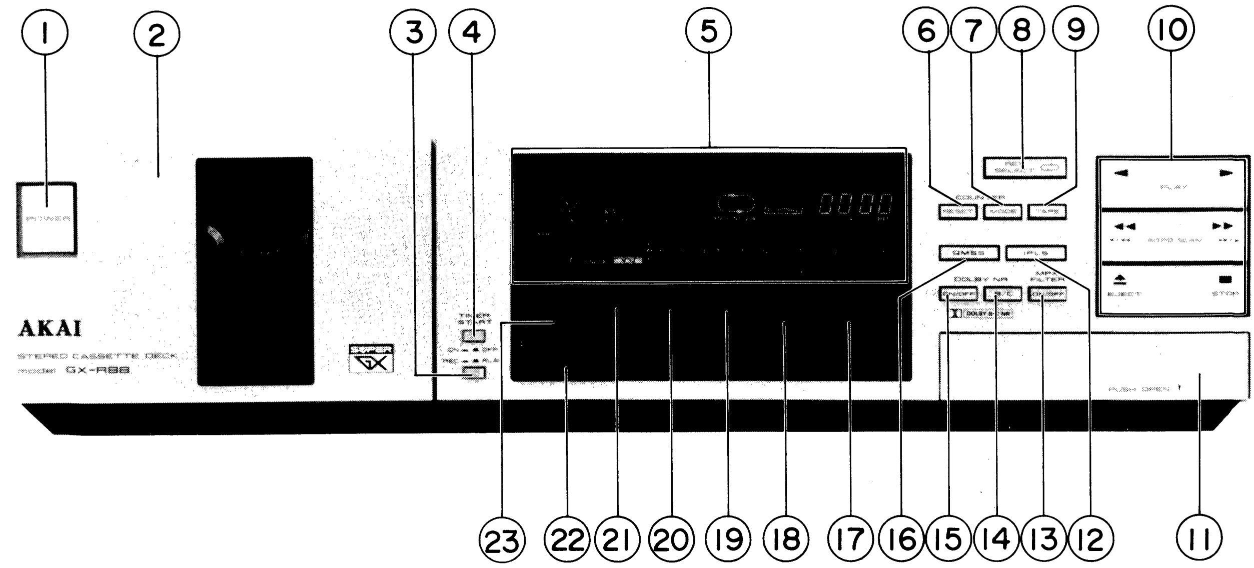

1
2
3
4
5
6
7
8
9
10
POWER
AKAI
STEREO CASSETTE DECK
model GX-R88
TIMER START
COUNTER
RESET
MODE
TAPE
QMSS
IPLS
DOLBY NR
MPX FILTER
ON/OFF
B/C
PLAY
AUTO SCAN
EJECT
STOP
PUSH OPEN
23
22
21
20
19
18
17
16
15
14
13
12
11

Fig. 3-1 Front View

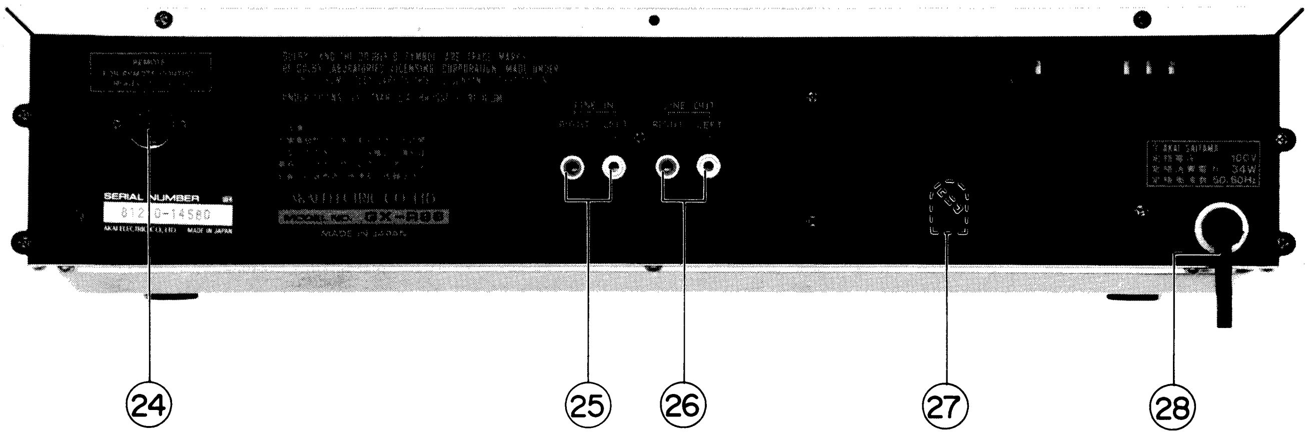

REMOTE
SERIAL NUMBER
812 0-14580
AKAI ELECTRIC CO., LTD. MADE IN JAPAN
AKAI ELECTRIC CO., LTD.
MODEL NO. GX-R88
MADE IN JAPAN
LINE IN
LINE OUT
RIGHT
LEFT
100V
34W
50/60Hz
24
25
26
27
28

Fig. 3-2 Rear View

1. POWER BUTTON
2. CASSETTE LID
3. TIMER REC/PB BUTTON
4. TIMER ON/OFF BUTTON
5. FL DISPLAY
6. COUNTER RESET BUTTON
7. COUNTER MODE BUTTON
   (ELAPSED, REMAIN, COUNTER)
8. REV SELECTOR BUTTON
9. TAPE BUTTON
   (C90, C60, C46, & LC46)
10. OPERATION BUTTONS
    FWD (►) REV (◄) F.F (►►)
    REW (◄◄) STOP (■) EJECT (⏏)
11. HEADPHONE & OUTPUT CONTROL
12. IPLS BUTTON
13. MPX FILTER ON/OFF BUTTON
14. DOLBY NR B/C BUTTON
15. DOLBY NR ON/OFF BUTTON
16. QMSS BUTTON
17. AUTO MUTE BUTTON (◙)
18. REC/PAUSE BUTTON (I●I)
19. REC CANSEL BUTTON
20. BLANK SEARCH BUTTON
21. PEAK/VU BUTTON
22. REC LEVEL VOLUME
23. TAPE/SOURCE MONITOR BUTTON
24. REMOTE CONTROL JACK
25. LINE IN (L/R) PIN JACK
26. LINE OUT (L/R) PIN JACK
27. VOLTAGE SELECTOR ($\boxed{\text{U}}$ model only)
28. AC POWER CORD

IV. PRINCIPAL PARTS LOCATION

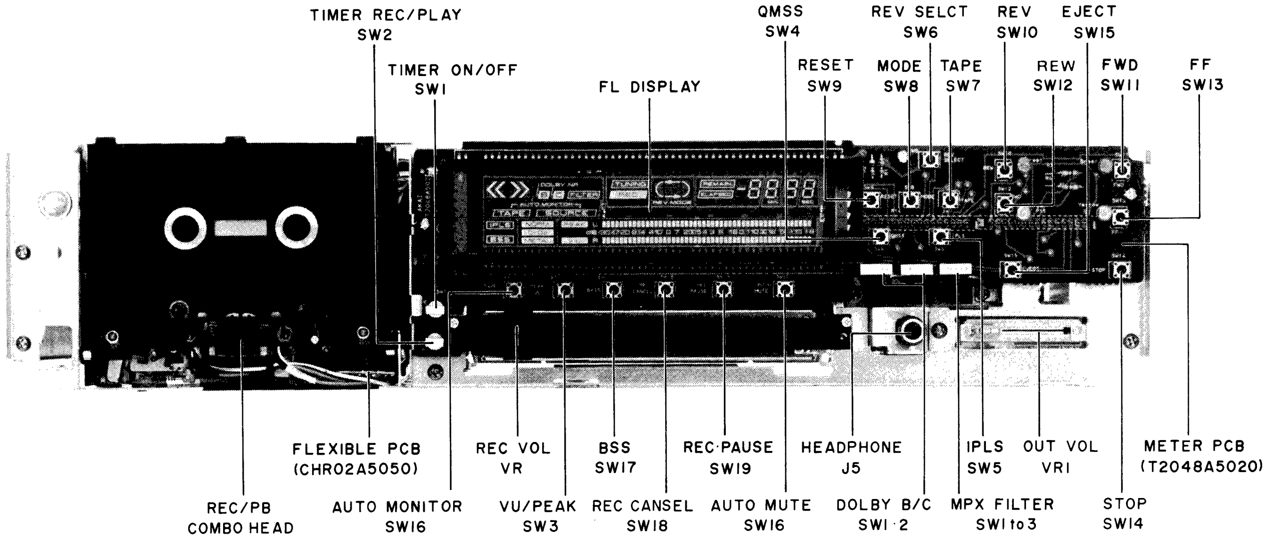

TIMER REC/PLAY SW2
TIMER ON/OFF SW1
FL DISPLAY
QMSS SW4
RESET SW9
REV SELCT SW6
MODE SW8
TAPE SW7
REV SW10
EJECT SW15
REW SW12
FWD SW11
FF SW13
FLEXIBLE PCB (CHR02A5050)
REC VOL VR
BSS SW17
REC·PAUSE SW19
HEADPHONE J5
IPLS SW5
OUT VOL VR1
METER PCB (T2048A5020)
REC/PB COMBO HEAD
AUTO MONITOR SW16
VU/PEAK SW3
REC CANSEL SW18
AUTO MUTE SW16
DOLBY B/C SW1·2
MPX FILTER SW1 to 3
STOP SW14

Fig. 4-1 Front View

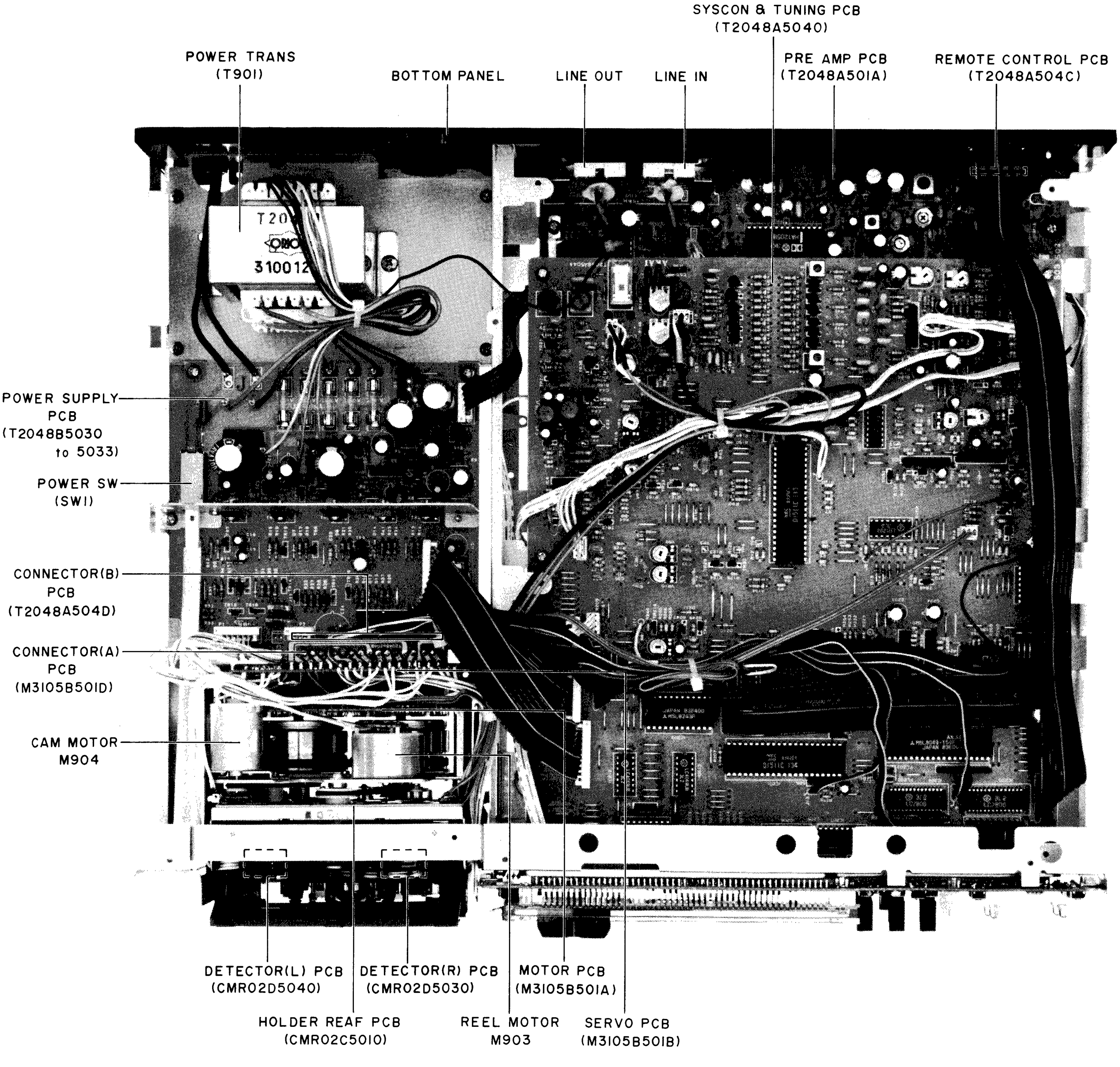

SYSCON & TUNING PCB (T2048A5040)
POWER TRANS (T901)
BOTTOM PANEL
LINE OUT
LINE IN
PRE AMP PCB (T2048A501A)
REMOTE CONTROL PCB (T2048A504C)
POWER SUPPLY PCB (T2048B5030 to 5033)
POWER SW (SW1)
CONNECTOR(B) PCB (T2048A504D)
CONNECTOR(A) PCB (M3105B501D)
CAM MOTOR M904
DETECTOR(L) PCB (CMR02D5040)
DETECTOR(R) PCB (CMR02D5030)
MOTOR PCB (M3105B501A)
HOLDER REAF PCB (CMR02C5010)
REEL MOTOR M903
SERVO PCB (M3105B501B)

Fig. 4-2 Top View

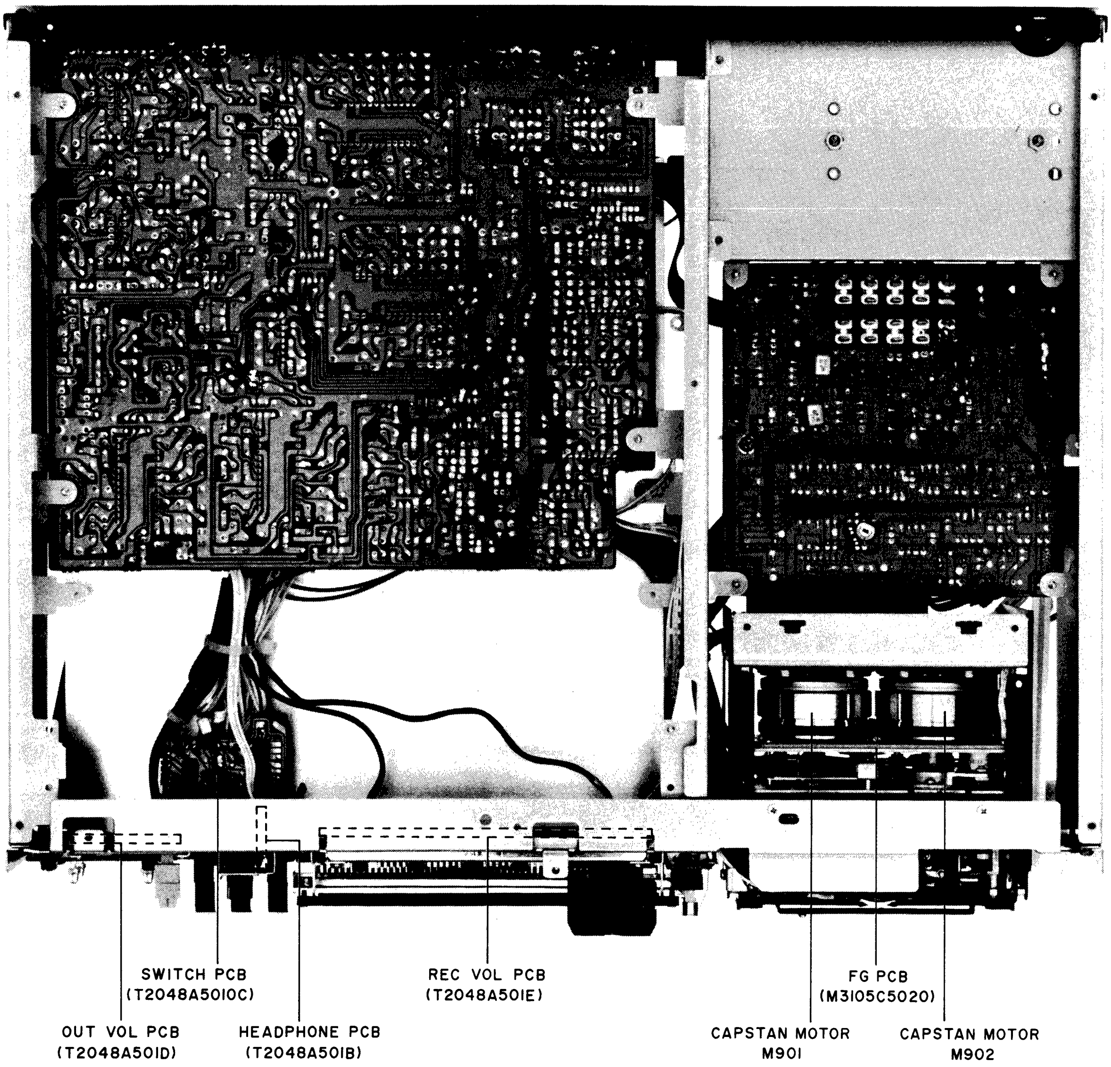

SWITCH PCB
(T2048A5010C)
REC VOL PCB
(T2048A501E)
FG PCB
(M3105C5020)
OUT VOL PCB
(T2048A501D)
HEADPHONE PCB
(T2048A501B)
CAPSTAN MOTOR
M901
CAPSTAN MOTOR
M902

Fig. 4-3 Bottom View

V. MECHANICAL ADJUSTMENT

5-1 PINCH ROLLER PRESSURE MEASUREMENT (Refer to Fig. 5-1)

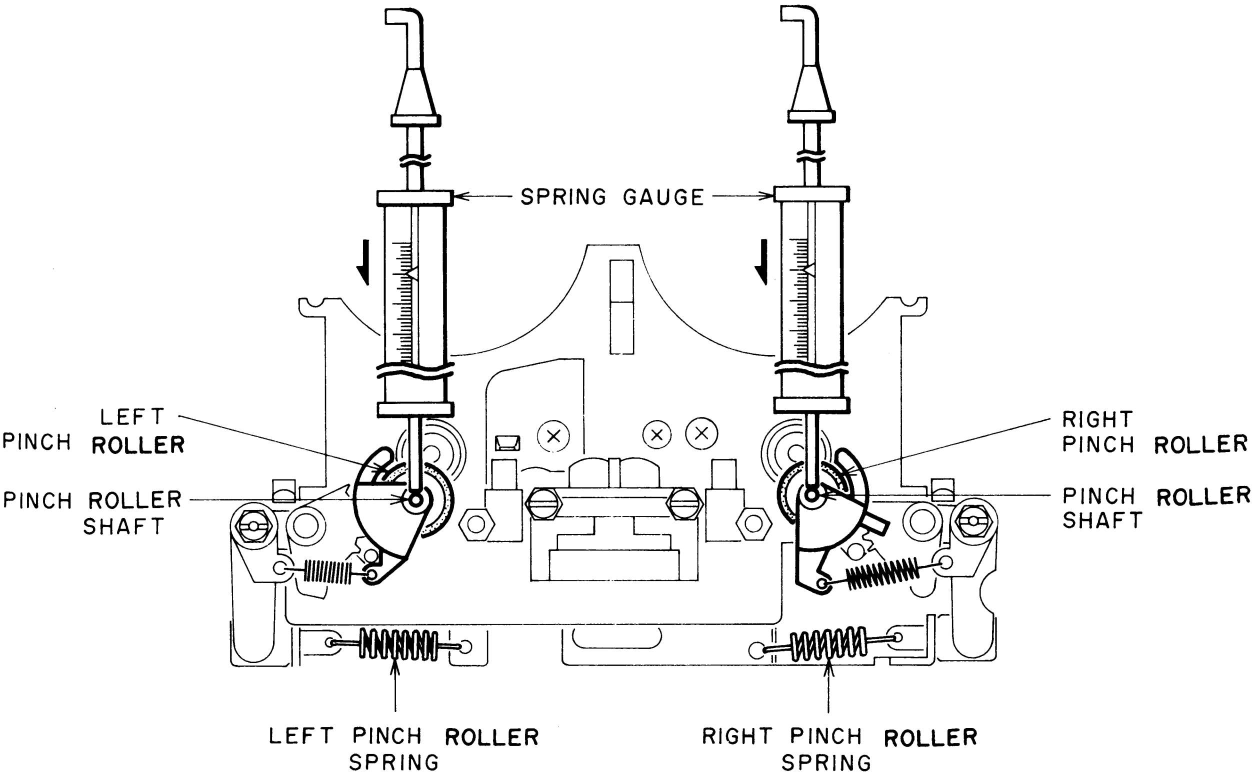

SPRING GAUGE
LEFT PINCH ROLLER
PINCH ROLLER SHAFT
RIGHT PINCH ROLLER
PINCH ROLLER SHAFT
LEFT PINCH ROLLER SPRING
RIGHT PINCH ROLLER SPRING

Fig. 5-1

Put in FWD PLAY mode. Push pinch roller shaft down with the spring gauge, and push the pinch roller 1 to 2 mm away from the capstan and release slowly.
Read the spring gauge at the moment the pinch roller touches the capstan and begins to rotate. Specified contact, pressures measurement is

RIGHT SIDE:	450 ± 80 grams
LEFT SIDE:	400 ± 80 grams

Confirm that the pinch roller pressure at REV PLAY mode

RIGHT SIDE:	400 ± 80 grams
LEFT SIDE:	450 ± 80 grams

If there is no measurement obtained, replace the pinch roller spring.

5-2 WINDING TORQUE MEASUREMENT IN EACH MODE (Refer to Fig. 5-2)

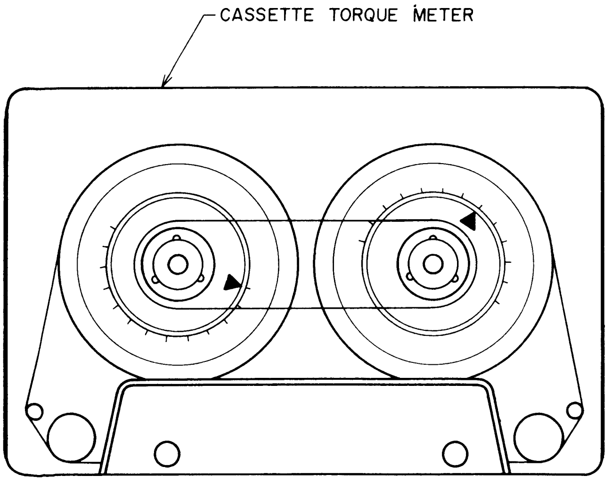

CASSETTE TORQUE METER

Fig. 5-2

Insert a cassette torque meter (AJ-751179) and measure in each mode. For Fast Forward and Rewind, measure at the end of the tape when the tape has stopped running.

Foward or Reverse mode

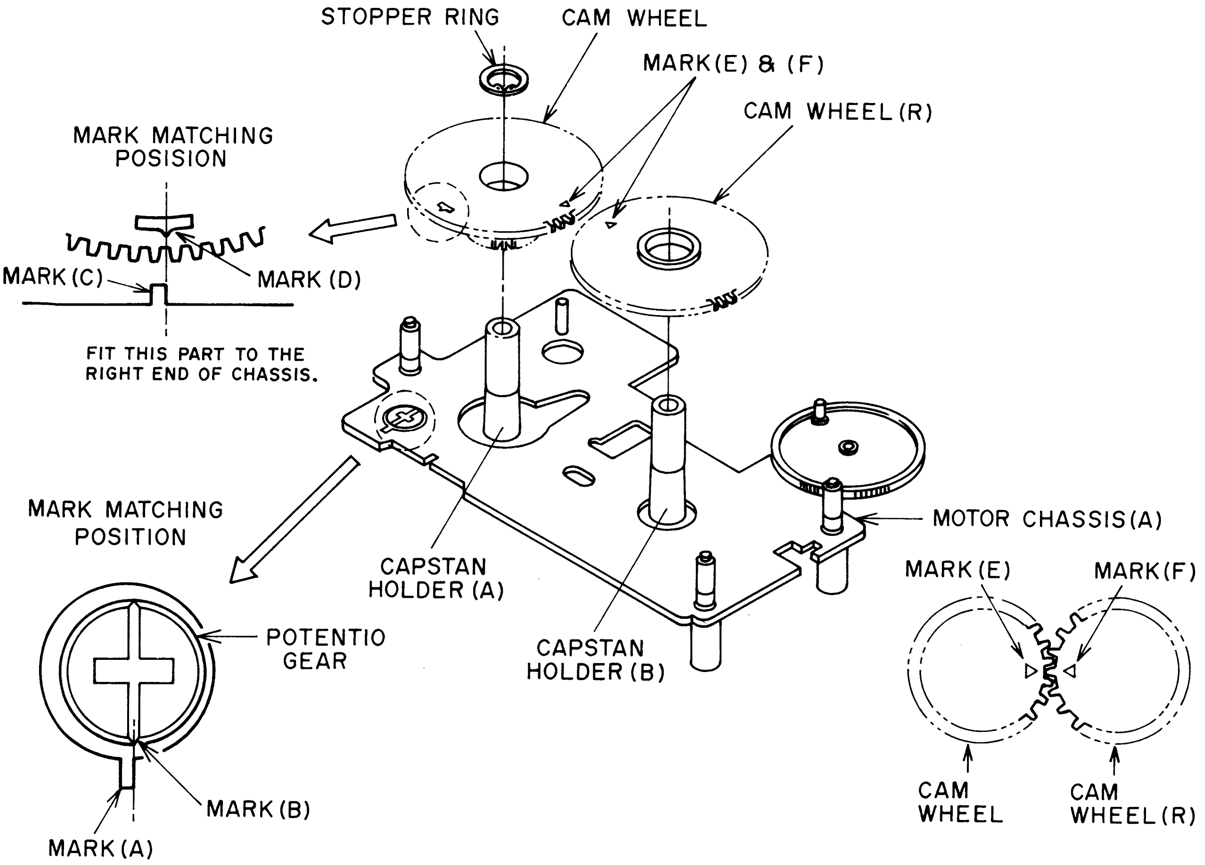
Take up Torque: 40^{+15}_{-10} g-cm

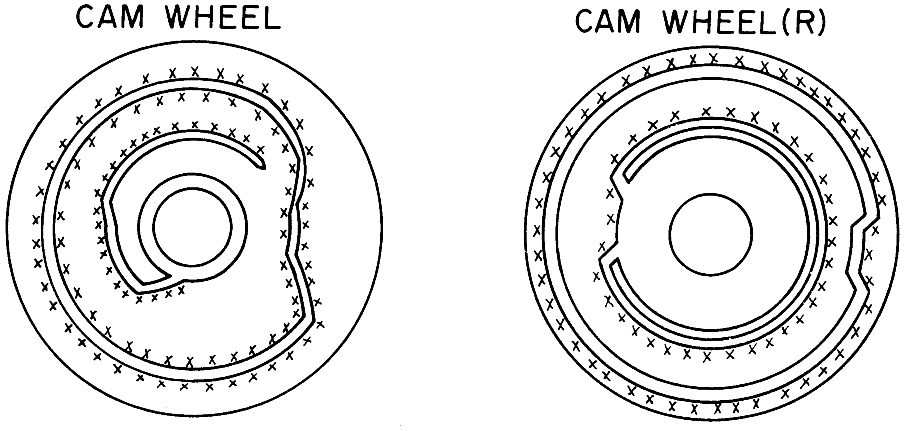
Back Tension Torque: 17 ± 3 g-cm

Fast Forward or Rewind mode

Take up Torque: 100^{+50}_{-30} g-cm

5-3 HOW TO INSTALL VOLUME (VR901) AND CAM WHEEL (Refer to Fig. 5-3)


STOPPER RING
CAM WHEEL
MARK(E) & (F)
CAM WHEEL(R)
MARK MATCHING POSISION
MARK(C)
MARK (D)
FIT THIS PART TO THE RIGHT END OF CHASSIS.
MARK MATCHING POSITION
POTENTIO GEAR
MARK(B)
MARK(A)
CAPSTAN HOLDER (A)
CAPSTAN HOLDER (B)
MOTOR CHASSIS(A)
MARK(E)
MARK(F)
CAM WHEEL
CAM WHEEL(R)


CAM WHEEL
CAM WHEEL(R)

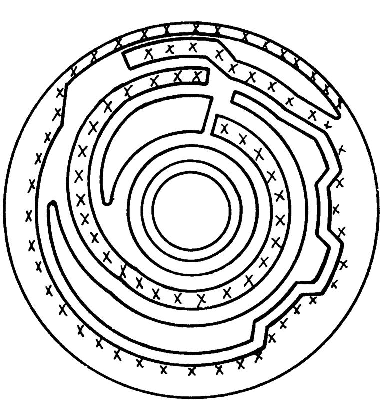


Fig. 5-3

1) Fitting position volume (potentio gear)
   Fit the right end of Mark (A) to the center of Mark (B) as shown in the Figure. (Fig. 5-3 ①)
2) Apply Molybdenum coat on the specified area indicated in "X" (Fig. 5-3 ②)
3) Set the cam wheel on the capstan holder (A). When the cam wheel is set properly, fit the center of Mark (D) to the right end of Mark (C). (Fig. 5-3 ③)
4) Fit the stopper ring in the groove of the capstan holder.
5) Set the cam wheel (R) on the capstan holder (B). When the cam wheel (R) is set properly, fit the center of Mark (E) to the center of Mark (F). (Fig. 5-3 ④)

5-4 POTENTIO METER PRESET VOLTAGE ADJUSTMENT (Refer to Figs. 5-4 to 5-8)

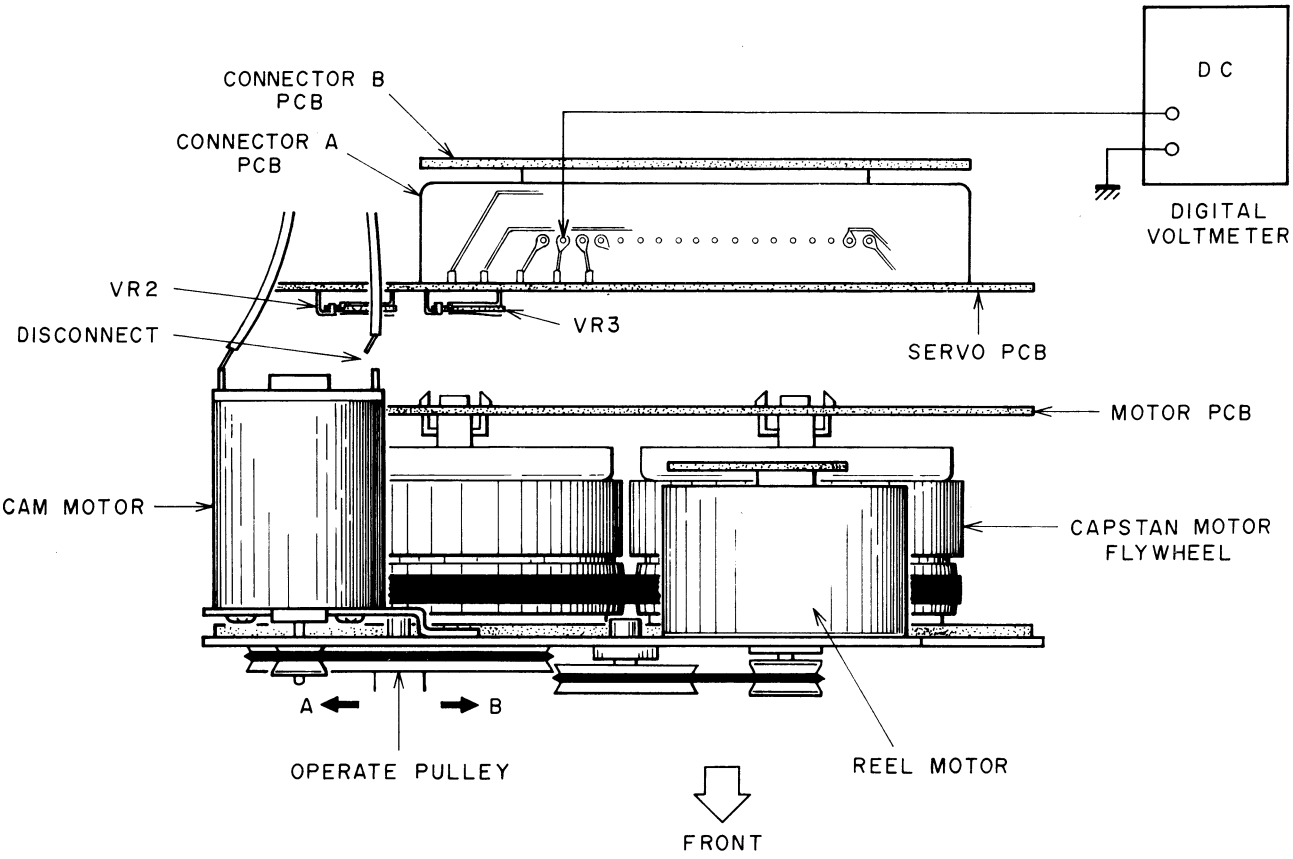

CONNECTOR B PCB
CONNECTOR A PCB
DC
DIGITAL VOLTMETER
VR2
DISCONNECT
VR3
SERVO PCB
MOTOR PCB
CAM MOTOR
CAPSTAN MOTOR FLYWHEEL
A
B
OPERATE PULLEY
REEL MOTOR
FRONT

Fig. 5-4

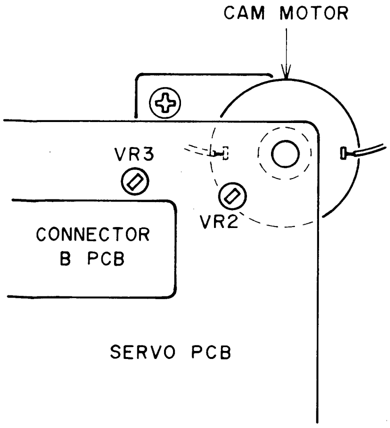

CAM MOTOR
VR3
VR2
CONNECTOR B PCB
SERVO PCB

Fig. 5-5

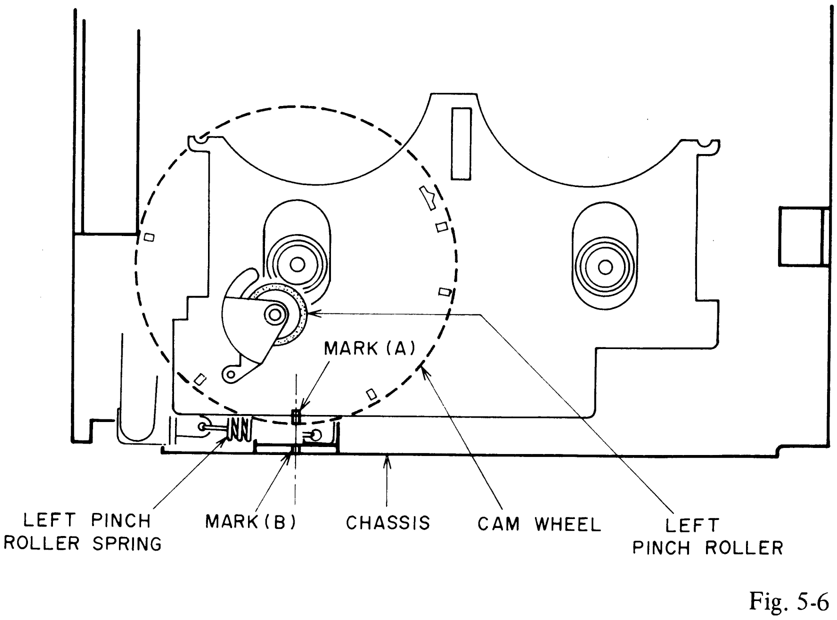

MARK (A)
LEFT PINCH ROLLER SPRING
MARK (B)
CHASSIS
CAM WHEEL
LEFT PINCH ROLLER

Fig. 5-6

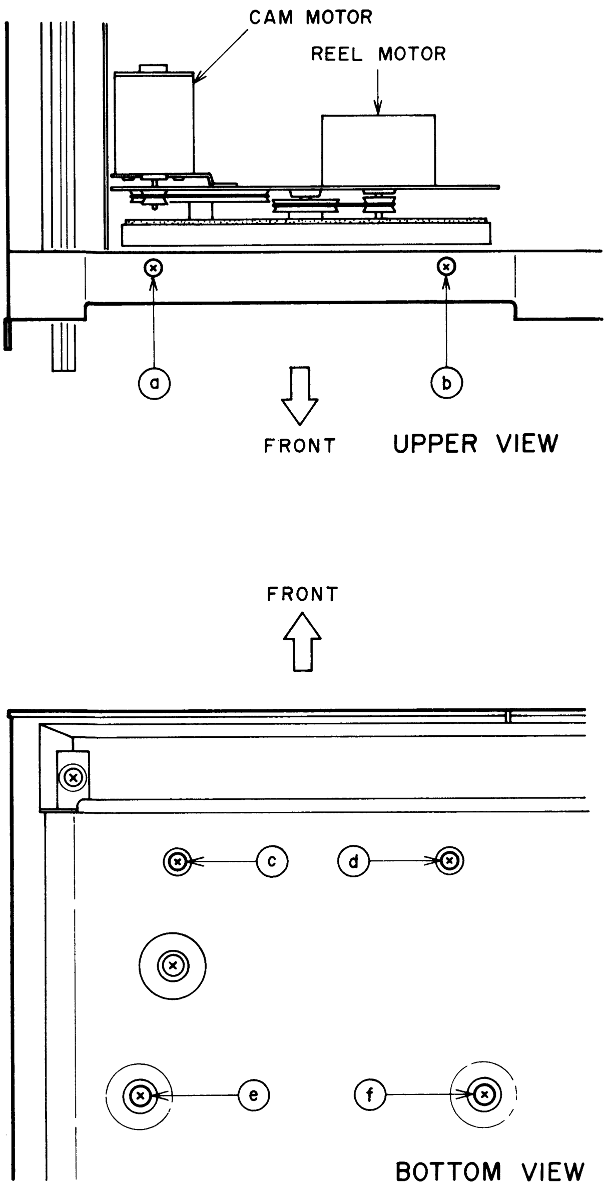


Fig. 5-7

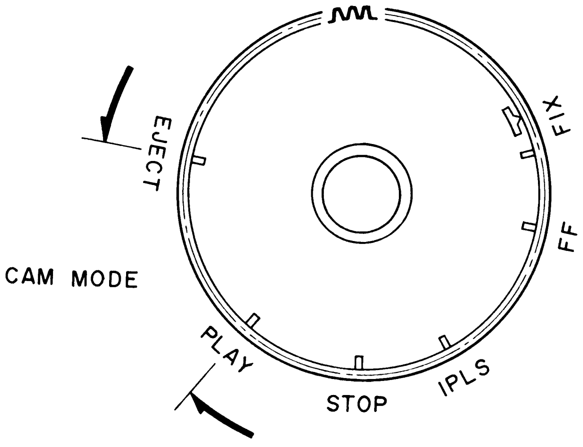


Fig. 5-8

1) LOW VOLTAGE ADJUSTMENT

(Refer to Fig. 5-4 and Fig. 5-5)

a. With power OFF, remove the connecting cord of the cam motor and turn the operate pulley fully A direction with your fingers.

b. Connect the digital voltmeter as shown in Fig. 5-4.

c. With power ON, adjust VR3 so that the voltage reading will be 1.255V ± 0.05V.

2) HIGH VOLTAGE ADJUSTMENT

(Refer to Fig. 5-4 and Fig. 5-5)

a. With power OFF, turn the operate pulley fully B direction with your fingers.

b. With power ON, adjust VR2 so that the voltage reading will be 9.22V ± 0.01V.

3) Repeat Items 1) and 2)

4) a. With Power OFF, connect the connecting cord of the motor.

b. Remove the digital voltmeter.

c. Remove the screws ⓐ to ⓕ on Fig. 5-6 and pull out the MECHA BLOCK slightly.

5) a. Set power to ON.

b. Adjust VR2 slightly so that center of Mark (A) to center of Mark (B) are coincide at STOP Mode as shown in Fig. 5-6 (STOP Mode voltage is about 7.35V when power supply voltage 9.75V at ① on Fig. 5-4).

c. Remove the cassette lid and the AUTO SYSTEM switch to IPLS mode.

d. Confirm that the head does not move up and down when the FF and REW switches are alternately pressed.

e. Turn the reel with fingers in STOP mode to check that the brake works sufficiently.
When the brake acts normally, the take-up reel does not turn clockwise while the supply reel does not rotate counterclockwise.

5-5 TAPE SPEED ADJUSTMENT (Refer to Fig. 5-9)

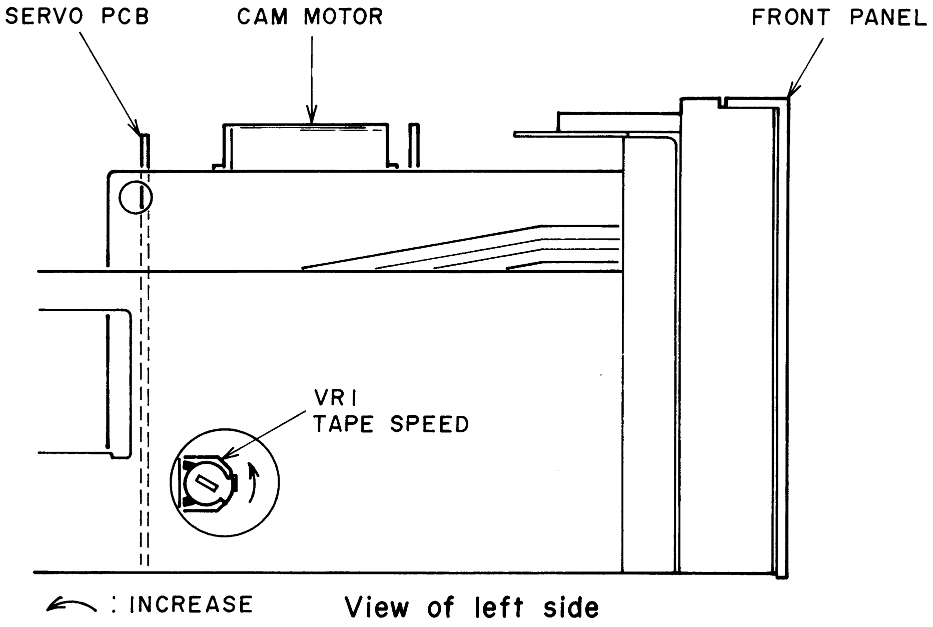
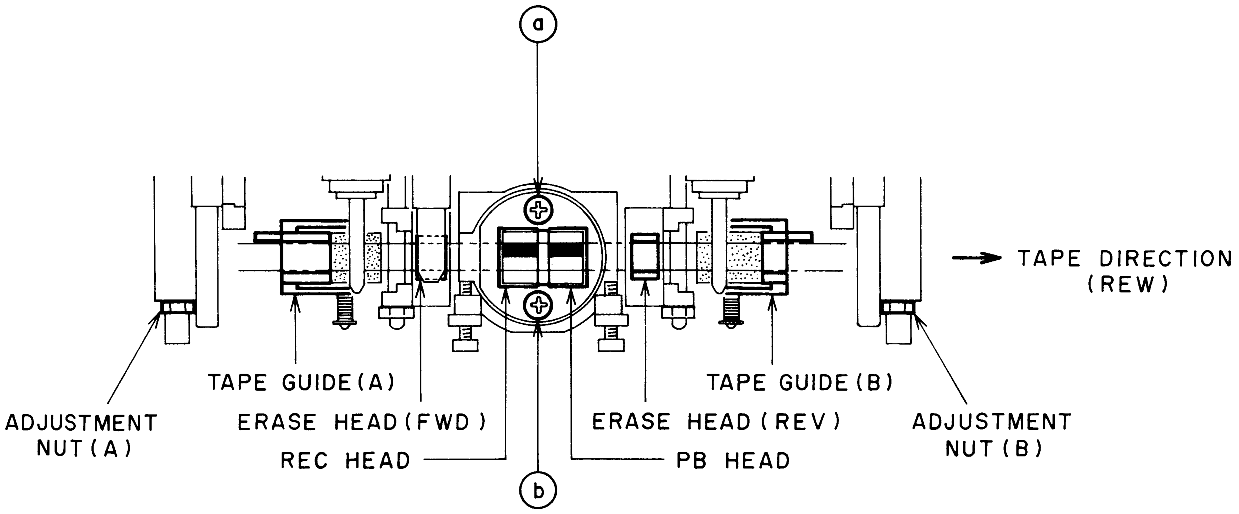

SERVO PCB
CAM MOTOR
FRONT PANEL
VR I
TAPE SPEED
: INCREASE
View of left side

Fig. 5-9

Connect a frequency counter to line output terminals. Playback a 1,000 Hz pre-recorded test tape (AT-750774) and adjust tape speed adjustment volume (SERVO PCB) to obtain a tape speed of 995 Hz to 1005 Hz.

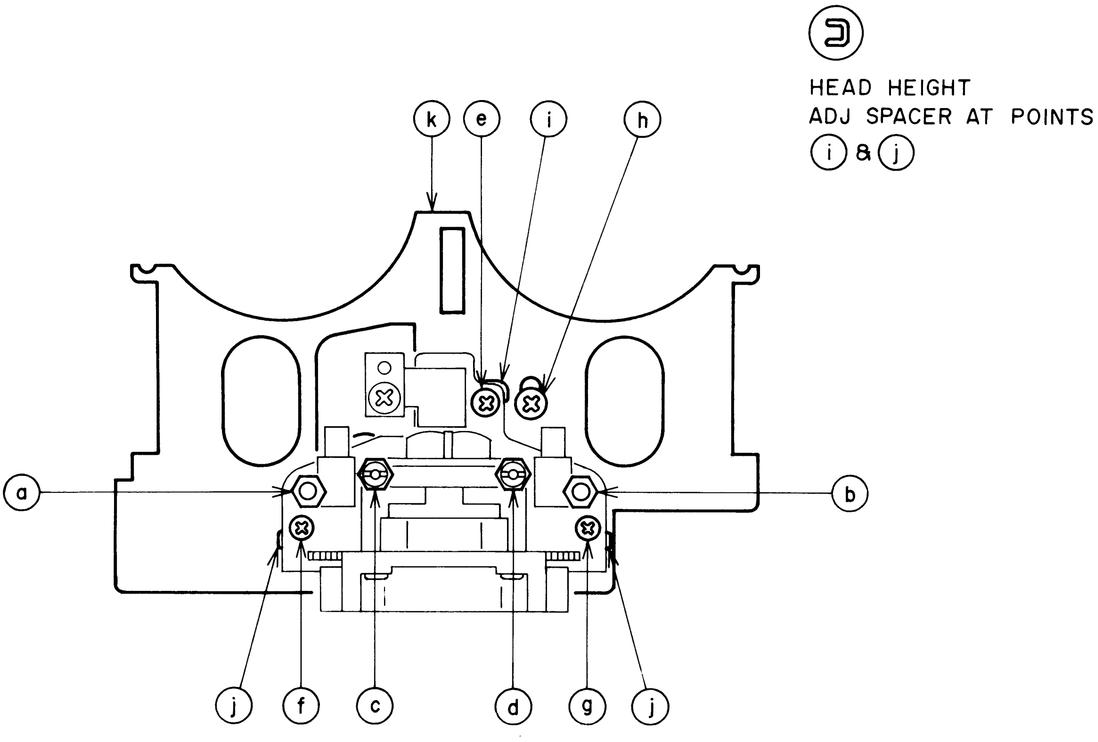
VI. HEAD ADJUSTMENT

6-1 TAPE GUIDE HEIGHT ADJUSTMENT
(Refer to Figs. 6-1 and 6-2)



a
TAPE DIRECTION (REW)
TAPE GUIDE (A)
TAPE GUIDE (B)
ADJUSTMENT NUT (A)
ERASE HEAD (FWD)
ERASE HEAD (REV)
ADJUSTMENT NUT (B)
REC HEAD
PB HEAD
b

Fig. 6-1



ↄ
HEAD HEIGHT
ADJ SPACER AT POINTS
i & j
k
e
i
h
a
b
j
f
c
d
g
j

Fig. 6-2

6-1-1 When Pinch Roller Block was replaced.

a) Set a Mirror Cassette Tape (AJ-751178)

b) If only the Pinch Roller Block (L) was replaced, select FWD PLAY mode and adjust Tape Guide (A) Height by turning the nut (A) so that the tape runs smoothly by the adjacent edge of both tape guides, and the tape is not hitched by those tape guides.

c) If only the Pinch Roller Block (R) was replaced, select REV PLAY mode and adjust Tape Guide (B) Height by turning the nut (B) in the same manner as item b).

d) Apply paint-lock on those nuts after the adjustment.

6-1-2 When only Erase Head was replaced (Refer to Figs. 6-1 and 6-2)

a) Set a 315 Hz or 333 Hz PB Level Adjustment Tape (AT-750773), and select FWD PLAY mode.
b) Adjust the Erase Head Height by turning the nuts ⓐ & ⓑ shown in Fig. 6-2, so that the Line out level is −5.5 dBm (315 Hz) or −6.1 dBm (333 Hz).
c) Select REV PLAY mode, and re-adjust the Erase Head Height by turning the nut ⓐ & ⓑ so that the difference in level (L-CH) between FWD and REV modes is within ±0.5 dBm.
d) Repeat the adjustments in item a), b) and c).
e) Set a Mirror Cassette Tape (AJ-751178) and select FWD PLAY mode.
f) Adjust Tape Guide (A) Height by turning the nut (A) and Erase Head (REV) Height by the nut (B) respectively, so that the tape runs smoothly by the adjacent edge of the Erase Head (FWD) without curling.
g) Next, select REV PLAY mode, and adjust Tape Guide (B) Height by turning the nut (B) so that the tape runs smoothly by the adjacent edges of both Erase Heads (FWD & REV) without curling.
h) Confirm that the Line output level (L-CH) is −5.5 dBm and the difference in level (L-CH) between FWD and REV modes is within ±0.5 dBm.

6-2 REC/PB HEAD AZIMUTH ADJUSTMENT (Refer to Fig. 6-2)

Play back a 10 kHz Head Azimuth Adjustment Tape (AT-750778) and adjust the screws ⓒ (FWD direction) and ⓓ (REV direction), so that the levels of both channels are maxima. (Note: Avoid turning the screws too far as other false maxima exist further away on both sides of the correct position.)

6-3 HEAD HEIGHT ADJUSTMENT (Refer to Figs. 6-1 & 6-2)

This adjustment is not necessary since this models GX-R99 is equipped with Rotary Head System (with REC & PB combination head). However, the confirmation of Head Height is necessary and it can be done as follows:

1) Confirm the azimuth in item 6-2.
2) Playback a 315 Hz (or 333 Hz) PB level Adjustment Tape (AT-750773) in FWD Play mode, and adjust the PB level Adjuster (VR5 on Pre Amp PCB) so that the LINE OUT level of left channel is −5.5 dBm.
   Then, check the level of the same channel in REV mode. The difference in level between FWD and REV modes should be within ±0.5 dBm
3) If the difference is more than ±0.5 dBm in item 2), adjust the erase heads by turning both Erase Head Height Adjustment screws ⓐ & ⓑ in the same direction by 1/4 tunr (±0.1 mm), so that difference is within ±0.5 dBm.
4) The Head Height Adjustment is necessary if still the difference could not be corrected by above adjustment. It can be done by changing the Head Height Adjustment Spacers ⓘ & ⓙ (The thicknesses of these spacers are ⓘ = 0.45 mm, ⓙ = 0.35 mm). Loosen the screws ⓔ ⓕ & ⓖ for the spacer replacement. If the level is lower in REV mode, it means that the head is too high, therefore replace the spacers by thinner ones. When the level is higher in REV mode, replace them by thicker ones.
   After the replacement of those spacers, do the same adjustment in item 1) and check the level of LINE OUT is −5.5 dBm ± 0.5 dBm.
   For the further confirmation, playback a 4 Track head Height Adjustment Tape (1 kHz/4 Track, AT-750775). Line Output level of both channels should be more than −8 dBm and the difference in level between FWD and REV modes should be within ±1 dB. Otherwise do the fine adjustment in the same manner as item 3) & 4).
5) When the head replacement is necessary, loosen only the screws ⓐ & ⓑ in Fig. 6-1 for easy replacement.

6-4 HEAD BLOCK PROJECTION ADJUSTMENT

Use a Cassette Head Projection Gauge (AT-751180) and select FWD or REV play mode.
Loosen the screw ⓗ and adjust chassis Head Part ⓚ so that the gauge indication at the time is 3.1 ± 0.15mm. After the adjustment, apply paint-lock on the screw ⓗ.

NOTES:
1. Be sure to clean the heads prior to head adjustment.
2. Be careful not to use a magnetized driver or other magnetized tools in the vicinity of the heads.
3. Be sure to demagnetize the heads with a Head Demagnetizer before and after head adjustment.

VII. ELECTRICAL ADJUSTMENT

7-1 PRE-AMPLIFIER P.C BOARD ADJUSTMENT

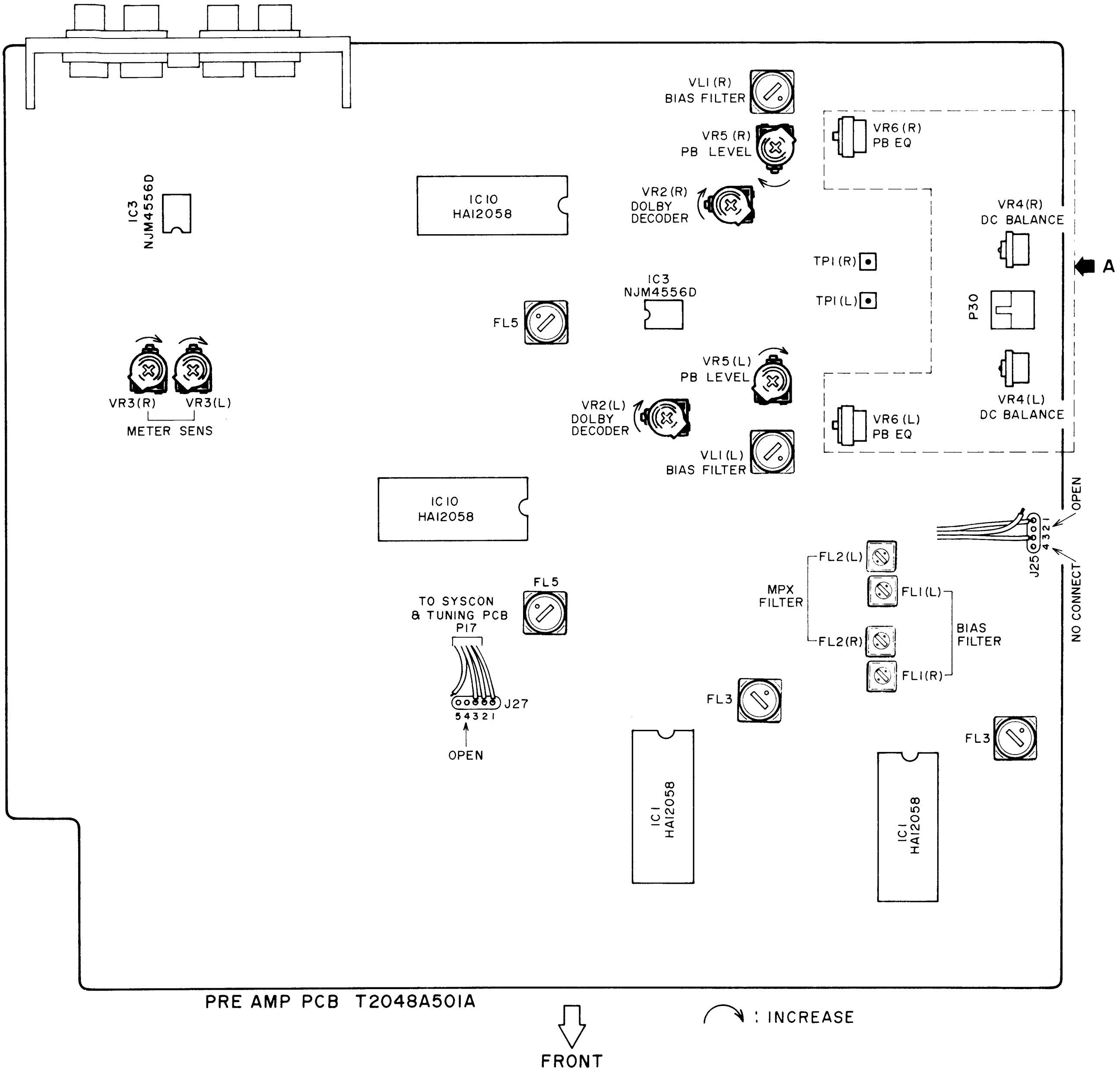

VL1 (R) BIAS FILTER
VR5 (R) PB LEVEL
VR2 (R) DOLBY DECODER
VR6 (R) PB EQ
VR4 (R) DC BALANCE
IC10 HA12058
IC3 NJM4556D
TP1 (R)
TP1 (L)
P30
A
FL5
VR5 (L) PB LEVEL
VR2 (L) DOLBY DECODER
VR6 (L) PB EQ
VR4 (L) DC BALANCE
VL1 (L) BIAS FILTER
VR3(R) VR3(L) METER SENS
OPEN
NO CONNECT
J25
4 3 2 1
FL2(L)
FL1(L)
FL2(R)
FL1(R)
MPX FILTER
BIAS FILTER
TO SYSCON & TUNING PCB P17
J27
5 4 3 2 1
FL3
IC1 HA12058
PRE AMP PCB T2048A501A
FRONT
: INCREASE

Fig. 7-1 Pre Amp P.C Board

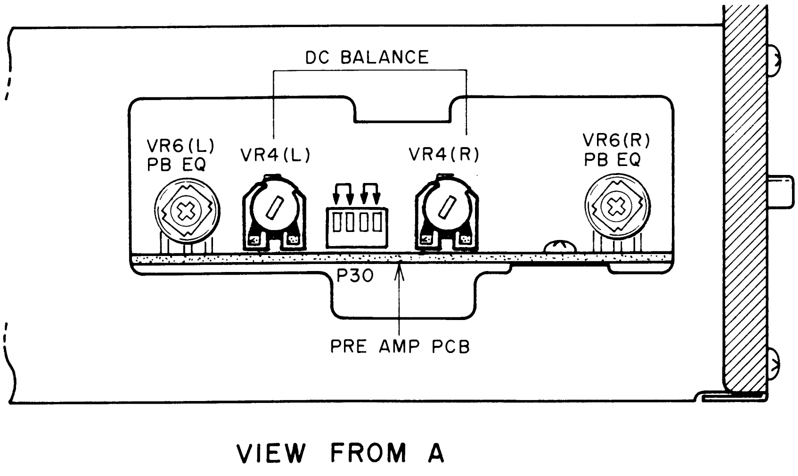

DC BALANCE
VR6(L) PB EQ
VR4(L)
VR4(R)
VR6(R) PB EQ
P30
PRE AMP PCB
VIEW FROM A

Fig. 7-2

PRE AMP ADJUSTMENT CHART (for more detail, see 7-1-1 to 7-1-3)

Step	Adjustment Item	Mode	Test Tape & Supply Signal	Adjustment Point	Result
1	DC Balance	STOP	Connect INPUT PIN of P30 with GND	VR4 (L) VR4 (R)	TP1 (L) TP1 (R) 0 ± 100 mV D.C
2	P.B Level	FWD PLAY	333 Hz 0 VU Tape (315 Hz 0 VU Tape)	VR5 (L) VR5 (R)	LINE OUT −6.1 ± 0.1 dBm (−5.5 ± 0.1 dBm)
		REV PLAY	333 Hz 0 VU Tape (315 Hz 0 VU Tape)	Confirmation	
3	P.B EQ	FWD PLAY	10 kHz P.B EQ Tape	VR6 (L) VR6 (R)	LINE OUT −20.5 ± 0.2 dBm
		REV PLAY	10 kHz P.B EQ Tape	Confirmation	−20.5 ± 2.0 dBm
4	METER Sensitivity	TAPE MONITOR SOURCE	1 kHz LINE IN (−5.2 dBm LINE OUT)	VR3 (L) VR3 (R)	+1 VU indication on VU METER Display
5	Dolby Decoder	FWD PLAY	315 Hz 0 VU Tape (333 Hz 0 VU Tape)	VR2 (L) VR2 (R)	LINE OUT −5.5 ± 0.3 dBm When Dolby ON (−6.1 ± 0.3 dBm)
6	MPX Filter	REC	19 kHz LINE IN	FL2 (L) FL2 (R)	LINE OUT MIN When MPX SW ON
7	BIAS Filter (Source)	REC/PLAY ↓ REC/PAUSE	No Signal Input METAL Tape (REC VR MAX)	FL1 (L) FL1 (R)	LINE OUT MIN
8	BIAS Filter (P.B)	REC/PLAY	No Signal Input METAL Tape	VL1 (L) VL1 (R)	LINE OUT MIN

7-1-1 PB EQ AMP ADJUSTMENT (TUNING P.C board is disconnectable from METER P.C board)

1) DC Balance
   a. Remove connector of P30 (PB HEAD Connector)
   b. Connect INPUT SIGNAL PIN of P30 Pin ①, ④ to GND.
   c. Adjust VR4 so that the voltage of TP1 will be 0 ± 100 mV DC.
2) PB Level
   a. FWD Play Back 333 Hz (AT-750773) or 315 Hz (AT-750773) PB level adjustment tape and adjust VR5 so that the LINE OUT level will be 333 Hz to −6.1 ± 0.1 dBm or 315 Hz to −5.5 ± 0.1 dBm.
   b. REV Play Back 333 Hz or 315 Hz PB level adjustment tape and confirm so that the LINE OUT level will be −6.1 ± 0.6 dBm (333 Hz) or −5.5 ± 0.6 dBm (315 Hz).
3) PB EQ
   a. FWD Play Back 10 kHz PB EQ adjustment tape (AT-750778) and adjust VR6 so that the LINE OUT level will be −20.5 ± 0.2 dBm.
   b. REV Play Back 10 kHz PB EQ adjustment tape and confirm so that the LINE OUT level will be −20.5 ± 2.0 dBm.

7-1-2 METER SENSITIVITY ADJUSTMENT

a. With the monitor SW to SOURCE and the meter SW to VU, Supply 1 kHz to LINE IN, a 1 kHz signal −5.2 dBm at LINE OUT.
b. Adjust VR3 so that the +1 VU.

7-1-3 DOLBY ADJUSTMENT

1) Dolby Decoder Adjustment
   a. FWD Playback 315 Hz PB level adjustment tape (AT-750773).
   b. Adjust VR2 so that the LINE OUT level will be −5.5 ± 0.3 dBm when Dolby ON. (At 333 Hz PB level adjustment tape, LINE OUT level will be −6.1 ± 0.3 dBm)
2) MPX Filter adjustment
   a. Set a blank tape and set to REC/PLAY mode.
   b. MPX filter SW OFF, input a signal of 19 kHz from LINE IN.
   c. Adjust FL2 so that the LINE OUT level will be at minimum when MPX filter SW is turned ON.
3) BIAS Filter Adjustment
   a. Set a metal tape and set to REC/PLAY (or REC/PLAY → REC/PAUSE).
   b. Adjust FL1 so that the LINE OUT level will be at minimum when the recording volume is set to MAX and the monitor SW to SOURCE.
   c. Set a metal tape and set to REC/PLAY mode.
   d. Adjust VL1 so that the LINE OUT level will be at minimum when the monitor SW is set to TAPE.

7-2 TUNING ADJUSTMENT POINT

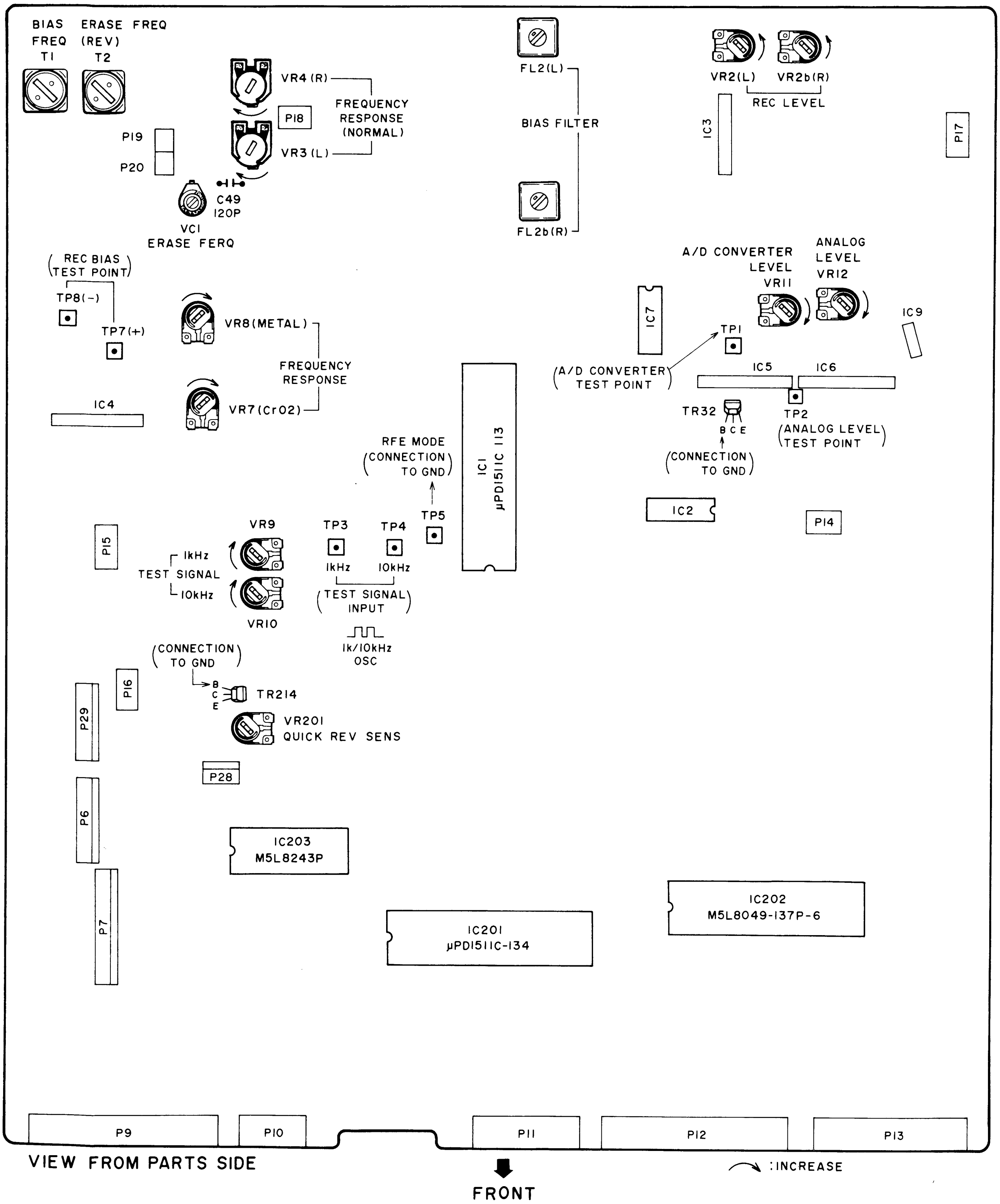

BIAS FREQ T1
ERASE FREQ (REV) T2
P19
P20
VR4 (R)
P18
FREQUENCY RESPONSE (NORMAL)
VR3 (L)
C49 120P
VC1 ERASE FERQ
FL2(L)
BIAS FILTER
FL2b(R)
VR2(L)
VR2b(R)
REC LEVEL
IC3
P17
(REC BIAS TEST POINT)
TP8(-)
TP7(+)
VR8(METAL)
FREQUENCY RESPONSE
VR7(CrO2)
IC4
IC7
A/D CONVERTER LEVEL VR11
ANALOG LEVEL VR12
IC9
TP1
(A/D CONVERTER TEST POINT)
IC5
IC6
TR32
B C E
TP2
(ANALOG LEVEL TEST POINT)
(CONNECTION TO GND)
RFE MODE (CONNECTION TO GND)
IC1 μPD1511C 113
TP5
IC2
P14
P15
VR9
TP3
TP4
1kHz TEST SIGNAL 10kHz
1kHz
10kHz
(TEST SIGNAL INPUT)
1k/10kHz OSC
VR10
(CONNECTION TO GND)
B C E
TR214
P16
P29
VR201 QUICK REV SENS
P28
P6
IC203 M5L8243P
P7
IC202 M5L8049-137P-6
IC201 μPD1511C-134
P9
P10
P11
P12
P13
VIEW FROM PARTS SIDE
FRONT
:INCREASE

Fig. 7-3 Sys-con & Tuning P.C Board

TUNING ADJUSTMENT CHART (for more detail see 7-2-1 to 7-2-7)

All the adjustment in reference to recording must be carried out in this REF mode.
REF mode will be achieved by connecting TP5 on TUNING P.C BOARD to ground within 3 seconds after the power is turned on. (see note 3)

Step	Adjustment Item	Mode	Test Tape & Supply Signal	Adjustment Point	Result	Remarks
1	Erase OSC	REV REC → REC PAUSE	METAL TAPE	T2	100±0.2 kHz	Connection the counter to P19
		FWD REC → REC PAUSE	METAL TAPE	VC1	100±1 kHz	Connection the counter to P20
2	Rec Bias OSC	FWD REC → REC PAUSE	METAL TAPE	T1	MINIMUM DC VOLTAGE	Between TP7 (+) to TP8 (−)
3	Freq Response (Norm)	FWD REC/PB	NORMAL TAPE 1 kHz, 10 kHz −25.5 dBm	VR4 (L) VR3 (R)	1 kHz to 10 kHz FLAT	
		REV REC/PB	Same as FWD			Confirmation
	(CrO_2)	FWD REC/PB	CrO_2 TAPE 1 kHz, 10 kHz −25.5 dBm	VR5	1 kHz to 10 kHz FLAT	
		REV REC/PB	Same as FWD			Confirmation
	(Metal)	FWD REC/PB	METAL TAPE 1 kHz, 10 kHz −25.5 dBm	VR6	1 kHz to 10 kHz FLAT	
		REV REC/PB	Same as FWD			Confirmation
4	Recording Level	FWD REC/PB	NORMAL TAPE 1 kHz −5.5 dBm	VR1 (L) VR2 (R)	−5.5±0.2 dBm	
		REV REC/PB	Same as FWD		FWD RESULT ±0.5 dBm	
5	A/D Converter	FWD REC PAUSE		VR11	3.0±0.05 VDC	Connection the Digital Volt Meter to TP1
6	Analog Level		10 kHz −25.5±0.2 dBm to J27-④	VR12	3.0±0.05 VDC	Unsolder J27-④ connect B of TR32 to GND
7	Test Signal (1 kHz, 10 kHz)	TAPE MONITOR SOURCE	SQUARE WAVE 1 kHz, 1 to 2V to TP3	VR9	−26.5±0.2 dBm	LINE OUT
			SQUARE WAVE 10 kHz, 1 to 2V to TP4	VR10	−26.5±0.2 dBm	LINE OUT
			Repeat 2 and 3 time so that step 7 will be near equal.			

NOTES:

1. Use the following cassette measuring tapes.

Normal Tape:	Maxell	UD	C-60
CrO_2 Tape:	TDK	SA	C-60
METAL Tape:	TDK	MA	C-60

2. a. Refer to Figs. 7-1 and 7-2 for pre amp adjustment.
   b. Refer to Fig. 7-3 for tuning adjustment.
3. Coution about REF mode
   a. REF mode will be cancelled only when the power is turned off.
   b. Only REC indicator (not TUNING indicator) will be lit for the recording in REF mode.
   c. Source signal will be mute in REF mode, unless J25 pin ② is disconnected.

7-2-1 ERASE OSC ADJUSTMENT

a. Set metal tape and set to REV REC/PLAY mode.

b. Connect the frequency counter to P19 (tuning PCB) and adjust T2 so that the frequency will be 100 ± 0.2 kHz.

c. Connect the frequency counter to P20 (tuning PCB) and adjust VC1 so that the frequency will be 100 ± 1 kHz. If the proper result could not obtain, cut C49 (120P) and adjust VC1 so that the frequency will be 100 ± 1 kHz.

7-2-2 BIAS OSC ADJUSTMENT

a. Connect a DC voltmeter to TP7 (+) and TP8 (–), and adjust T1 so that the voltage will be minimum.

7-2-3 FREQUENCY RESPONSE ADJUSTMENT

a. FWD record and playback 1 kHz/10 kHz, –25.5 dBm using a normal tape and adjust VR4 (L-CH) and VR3 (R-CH) so that 1 kHz/10 kHz will be flat response (provided L-R difference is within in 0.5 dBm).

b. FWD record and playback 1 kHz/10 kHz, –25.5 dBm using a CrO_2 tape and adjust VR5 so that 1 kHz will be flat response.

c. FWD record and playback 1 kHz/10 kHz, –25.5 dBm using a metal tape and adjust VR6 so that 1 kHz/10 kHz will be flat response.

d. Confirm REV mode at 3 type tape mode.

7-2-4 RECORDING LEVEL ADJUSTMENT

a. FWD record and playback 1 kHz, –5.5 dBm using a normal tape, and adjust VR2 so that the difference between recording and playback level will be 0 ± 0.2 dBm.

b. Confirm between FWD and REV within 0.5 dBm.

7-2-5 A/D CONVERTER LEVEL ADJUSTMENT

a. Set REC/PAUSE mode.

b. Adjust VR11 so that the voltage to GND of TP1 will be 3 ± 0.05V DC.

7-2-6 ANALOG LEVEL ADJUSTMENT

a. Unsolder the wire connected to J27 ④ in PRE AMP PCB.
(Refer to Fig. 7-1) (The wire is Rch PB out)

b. Connect the base of TR32, the rear side of R137 or the left side of R138 to GND.

c. Input 10 kHz, –25.5 ± 0.2 dBm to Rch PB out terminal of J27 ④.
Measurement Input voltage at between terminal to GND.
(–25 ± 0.2 dBm)

d. Adjust VR12 so that the voltage to GND of TP2 will be 3 ± 0.05 V DC.

7-2-7 TEST SIGNAL LEVEL ADJUSTMENT

a. Unsolder the wire connected to J25 ② in PRE AMP PCB (Refer to Fig. 7-1).

b. Set the monitor SW to SOURCE.

c. Input square wave 1 kHz, 1 to 2V to TP3.
Measurement input voltage level at oscilloscope.

d. Adjust VR9 so that LINE OUT level will be –26.5 ± 0.2 dBm.

e. Input square wave 10 kHz 1 to 2V to TP4.
When TP4 connect input signal, TP3 remove input signal.

f. Adjust VR10 so that LINE OUT level will be –26.5 ± 0.2 dBm.

g. Repeat 2 and 3 times so that item d and item f will be near equal.

7-3 QUICK REVERSE SENSITIVITY ADJUSTMENT (Refer to Fig. 7-4)

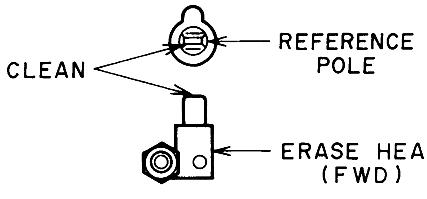


Fig. 7-4

a. Make a tapeless cassette pack by removing the tape from the white colored cassette tape.

b. Connect the Digital Voltmeter between the Base of TR214 and earth.

c. Using the tapeless cassette pack, adjust VR201 (on TUNING & SYS-CON PCB, refer to Fig. 7-3) so that the Digital Voltmeter readings 4.30V ± 0.05V DC at FWD play mode.

NOTE: Clean the Reference Pole and the Erase Head (FWD side), before this adjustment. (Refer to Fig. 7-4)

VIII. DC RESISTANCE OF HEADS

Parts		Name	DC Resistance
REC/PB HEAD	H901	RP4-10	REC: 30 Ohms PB: 305 Ohms
ERASE HEAD (NOR) ERASE HEAD (REV)	H902 H903	E4-11 E4-11S	3.7 Ohms
CAPSTAN MOTOR	M901 M902		85 Ohms ±0.5%
REEL MOTOR	M903	RF-510T	34 Ohms
CAM MOTOR	M904	EF-2805	20 Ohms

IX. P.C BOARD TITLES AND IDENTIFICATION NUMBERS

P.C Board Title	P.C Board Number
SYS-CON & TUNING P.C BOARD	T2048A5040
PRE AMP P.C BOARD	T2048A501A
OUT VOLUME P.C BOARD	T2048A501D
SWITCH P.C BOARD	T2048A5010C
HEAD PHONE P.C BOARD	T2048A501B
POWER SUPPLY P.C BOARD	T2048B5030 $\boxed{J}$
	T2048B5031 $\boxed{U}$
	T2048B5032 $\boxed{C}$ $\boxed{A}$
	T2048B5033 $\boxed{E}$ $\boxed{V}$ $\boxed{S}$ $\boxed{B}$
FILTER P.C BOARD	M3105B501E
METER P.C BOARD	T2048A5020
SERVO P.C BOARD	M3105B501B
POTENTION P.C BOARD	M3105B501C
CONNECTOR A P.C BOARD	M3105B501D
CONNECTOR B P.C BOARD	T2048A504D
MOTOR P.C BOARD (CAPSTAN)	M3105B501A
FG P.C BOARD	M3105C5020
REMOTE CONTROL P.C BOARD	T2048A504C
HOLDER LEAF SW P.C BOARD	CMR02C5010
FLEXIBLE P.C BOARD	CHR02A5050
DETECTOR (L) P.C BOARD	CMR02D5040
DETECTOR (R) P.C BOARD	CMR02D5030
LED P.C BOARD	CMR02D5020
REC VOLUME P.C BOARD	T2048A501E

SECTION 2

PARTS LIST

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RECOMMENDED SPARE PARTS 25
1. MECHA CMR02 BLOCK 26
2. MOTOR BLM-500 BLOCK 28
3. SYSCON AND TUNING P.C BOARD BLOCK 30
4. PRE AMP IC P.C BOARD BLOCK 31
5. METER P.C BOARD BLOCK 31
6. POWER SUPPLY P.C BOARD BLOCK 32
7. MOTOR P.C BOARD BLOCK 32
8. ASSEMBLY BLOCK 33
9. FINAL ASSEMBLY BLOCK 34
INDEX 35

Resistors and Capacitors which are not listed in this parts list, please refer to COMMON LIST FOR SERVICE PARTS.

ATTENTION

1. When placing an order for parts, be sure to list the parts no. model no., and description. There are instances in which if any of this information is omitted, parts cannot be shipped or the wrong parts will be delivered.
2. Please be careful not to make a mistake in the parts no. If the parts no. is in error, a part different from the one ordered may be delivered.
3. Because parts number and parts unit supply in the Preliminary Parts List may be partially changed, please use this parts list for all future reference.

HOW TO USE THIS PARTS LIST

1. This Parts List shows the parts that are considered necessary for repairs. Other parts, such as resistors and capacitors, are shown in the "Common List for Service Parts". Select and order such parts from the "Common List for Service Parts".
2. The Recommended Spare Parts shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not be supplied in principle.
4. How to read list
   a) Mechanism Block
   b) P.C Board Block

2. HEAD BASE BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
2-1x	BH-T2023A320A	HEAD BASE BLOCK GX-F66R
2-2	HP-H2206A010A	HEAD R/P PR4-8FU C
2-3	ZS-477876	PAN20x03STL CMT
2-4	ZS-536488	BID20x08STL CMT
2-5	ZG-402895	CS ANGLE ADJUST SPRING

SP (Service Parts) Classification

A small "x" indicates the inability to show that particular part in the Photo or Illustration.

This number corresponds with the individual parts index number in that figure

This number corresponds with the Figure Number

6. SYS. CON. P.C BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
6-1	BA-T2034A070A	PC SYS CON BLK GX-F44R
6-IC1	EI-324536	IC HD14049BP
6-IC2	EI-336801	IC MB8841-564M
6-IC3	EI-331661	IC SN7405N
6-IC4	EI-336725	IC M54527P
6-TR1to4	ET-200985	TR 2SC2603 F,G
6-TR5to28	ET-554657	TR 2SA733A P,Q
6-D1	ED-318292	D SILICON H 1S2473T-77 T26
6-D2to4	ED-308952	D GERMA V 1K34A-LR F07
6-D5to10	ED-318292	D SILICON H 1S2473T-77 T26
6-X1	EI-318384	OSC X'TAL NC-18C 3.579545MHZ

SP (Service Parts) Classification

This reference numbers corresponds with symbol numbers of Schematic Diagrams.

5. Both the kind of part and installation position can be determined by the Parts Number. To determine where a parts number is listed, utilize Parts Index at end of Parts List. It is necessary first of all to find the Parts Number. This can be accomplished by using the Reference Number listed at right of parts number in the Parts Index.

WARNING

⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

AVERTISSEMENT

⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SURETE. POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.

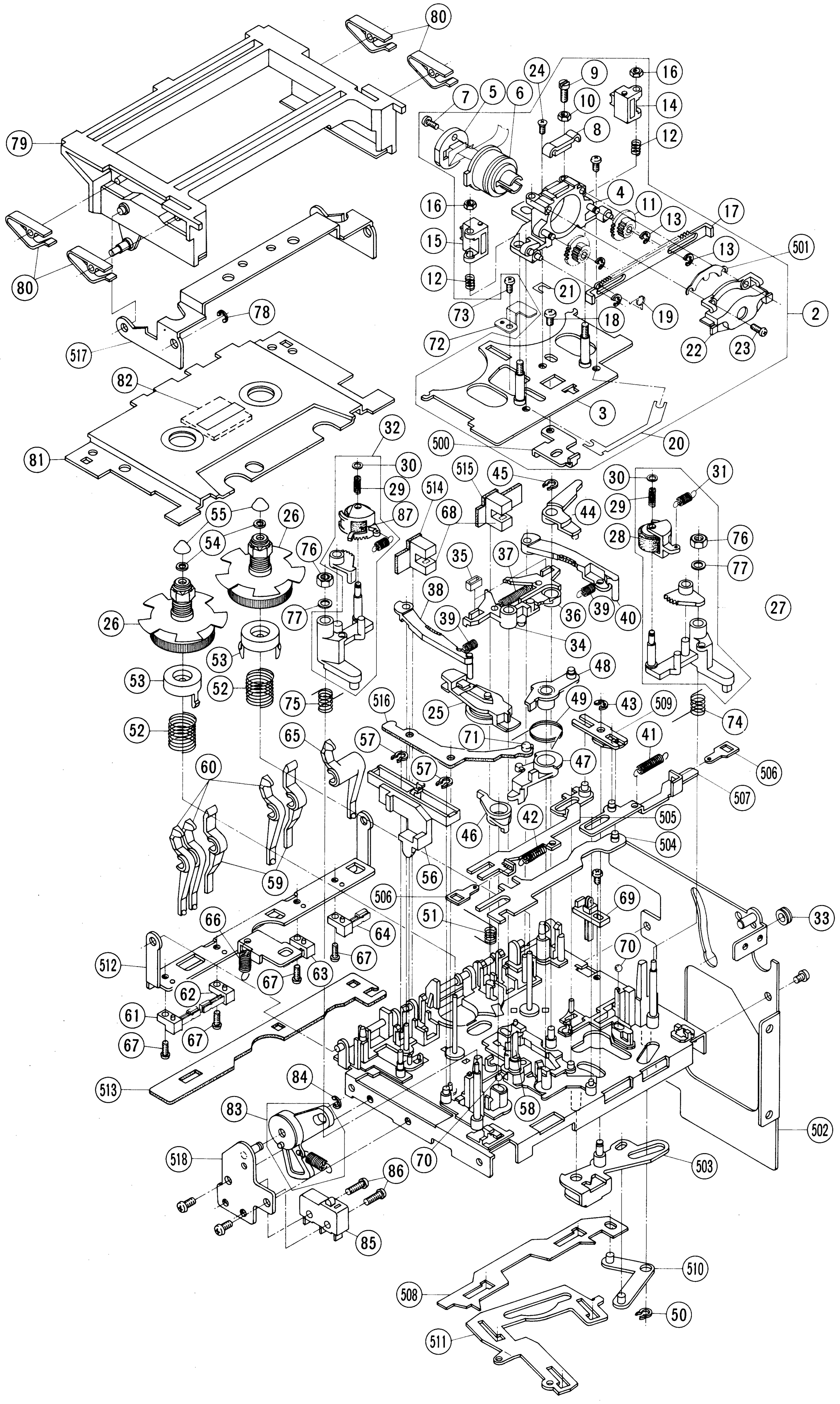
RECOMMENDED SPARE PARTS

Because, if the parts listed below are on hand, almost any repair can be accomplished, we suggest that you stock these Recommended Spare Parts Items.

NO.		PARTS NO.	DESCRIPTION
1		BH-T2049A070A	HEAD BLK GX-R99
2		BM-B604527	⚠ MOTOR OPERATION PART
3		BM-B604526	⚠ REEL MOTOR PART
4		BM-M3105A010A	MOTOR BLM-500
5		BR-T2049A040A	REEL TABLE BLK GX-R99
6		BT-347972	⚠ TRANS POWER T2048AC
7		BT-347974	⚠ TRANS POWER T2048BS
8		BT-347973	⚠ TRANS POWER T2048EV
9		BT-347971	⚠ TRANS POWER T2048J
10		BT-347970	⚠ TRANS POWER T2048U
11		BZ-T2049A020A	MECHA CMR02 BLK GX-R99
12		EC-348292	C S-FIX H ECR-BA160N11 12-160
13		ED-330319	⚠ D SILICON DBA10B 100/1.0A
14		ED-330987	⚠ D SILICON RB152 200/1.5A
15		ED-330622	⚠ D SILICON 1SR35-100VL 100/1.0A
16	N	ED-308952	D GERMA V 1K34A-LR F07
17		ED-337010	D LED SLF201C GRN
18		ED-348121	D LED TLG143 GRN
19		ED-348122	D LED TLY143 YLW
20		ED-301911	D SILICON H DS448
21		ED-344280	D SILICON H GMA-01-FY2 F05
22		ED-624903	D SILICON H 1S2473
23	N	ED-200468	D SILICON V DS448-VB6
24	N	ED-346633	D SILICON W03B F10 100/1.0A
25		ED-330622	D SILICON 1SR35-100VL 100/1.0A
26	N	ED-346478	D ZENER H HZ11FA F10 B2
27	N	ED-346493	D ZENER H HZ15FA F10 2
28	N	ED-346503	D ZENER H HZ20FA F10 2
29	N	ED-346505	D ZENER H HZ22FA F10 1
30		ED-346462	D ZENER H HZ7FA F10 C2
31	N	ED-346440	D ZENER H HZ5FA F10 B1
32	N	ED-346441	D ZENER H HZ5FA F10 B2
33	N	ED-346446	D ZENER H HZ5FA F10 C3
34	N	ED-346450	D ZENER H HZ6FA F10 B2
35	N	ED-346452	D ZENER H HZ6FA F10 C1
36	N	ED-346454	D ZENER H HZ6FA F10 C3
37	N	ED-346473	D ZENER H HZ9FA F10 C3
38		ED-348001	D ZENER V HZ2B-1S7
39	N	ED-338082	D ZENER V HZ5C-1S7
40		EF-601942	⚠ FUSE SEMKO T 250V 0.63A
41		EF-623103	⚠ FUSE SEMKO T 250V 1.00A
42		EF-601964	⚠ FUSE SEMKO T 250V 1.60A
43		EF-306124	⚠ FUSE TSC A 250V 0.63A
44		EF-309387	⚠ FUSE TSC A 250V 1.00A
45		EF-311839	⚠ FUSE TSC A 250V 1.60A
46		EF-305703	⚠ FUSE TSC 125V 0.63A
47		EF-310229	⚠ FUSE TSC 125V 1.00A
48		EF-308847	⚠ FUSE TSC 125V 1.60A
49		EH-337380	FILTER CE KMFC-1001S 3.580MHZ
50		EH-336775	FILTER DB D07001K 19KHZ
51		EH-336776	FILTER DB D07003K 100KHZ
52		EH-347991	OSC CE CSA6.00MS 6MHZ
53		EI-336987	HALL ELEMENT DHD-H150
54		EI-330352	IC BA6109
55		EI-348105	IC HA12010
56		EI-349196	IC HA12058
57		EI-336761	IC LA6458S
58		EI-337013	IC LB1290
59		EI-345765	IC LB1292
60		EI-338171	IC LC4069UB
61		EI-348111	IC LC4071B
62		EI-337008	IC LC7800
63		EI-352232	IC M5L8049-154P-6
64		EI-348110	IC M5L8243P
65		EI-348701	IC M51143L
66		EI-337228	IC M5218L0
67		EI-348123	IC M5230AL
68		EI-307644	IC NJM4556D
69		EI-201940	IC NJM4558S
70		EI-337126	IC TA7332P
71		EI-337529	IC TA78L005AP
72	N	EI-310036	IC TC4066BP
73		EI-336992	IC UPC1043C
74		EI-337360	IC UPC4082C
75		EI-349145	IC UPD1511C-113
76		EI-348108	IC UPD1511C-134
77		EI-338238	IC UPD4051BC
78		EI-347923	IC UPD4071BC
79		EM-347978	IND FL BG-167Z
80		EO-348100	COIL OSC 1 25-5059-22
81		EO-348101	COIL OSC 2 25-5060-02
82		EO-315758	COIL TUN 1 100Z-431 100.00KHZ
83		EO-336738	COIL TUN 1 102AZ-004 19.80KHZ
84		EO-337055	COIL VARI 1 FE002S 10MH
85		EO-331280	COIL VARI 1 46-1072-11 22MH
86		EQ-344440	RELAY SIGNAL G2V-282P 2TR 24V
87		ER-348272	⚠ R FUSE ERD2FC S10 1/4W 12R0G
88		ER-318248	⚠ R FUSE ERD2FC S10 1/4W 47R0G
89		ER-331188	⚠ R FUSE ERD2FC S10 1/4W 8R2J
90		ER-350808	⚠ R FUSE ERQ14AJ S10 1/4W 181J
91		ER-323487	R MF H F10 1/4W 1503F
92		ES-336990	SW LEAF BSW-169 01-1 NO
93		ES-336990	SW LEAF BSW-169 01-1 NO
93		ES-344253	SW LEAF MSW-1418J 01-1 NO
94		ES-344257	SW LEAF MSW-1418L 01-1 NO
95		ES-337427	SW MICRO SS-01-E
96		ES-348133	SW PUSH ESB-62746 3 THROW
97		ES-348998	SW PUSH SDL1P 01-1
98		ES-346260	SW PUSH SPH121A 2-02-02N
99		ES-305733	SW SELECTOR HXW0131-260 01-4
100		ES-336780	SW TACT KHH10902
101		ET-310341	PHOTO SENSOR PT350 T
102		ET-345091	PHOTO SENSOR SPI-201-40 B,C
103		ET-321016	TR FET 2SK117 GR,BL
104	N	ET-341400	TR FET 2SK170 BL, GR
105	N	ET-337234	TR FET 2SK270 GR, BL
106	N	ET-200558	TR 2SA1115 E,F
107		ET-350806	TR 2SA1115 F,G
108		ET-348950	TR 2SA1345
109		ET-349725	TR 2SA1391 S,T
110		ET-349718	TR 2SA1392 S,T
111	N	ET-554657	TR 2SA733A P,Q
112		ET-337112	TR 2SA798 F,G
113	N	ET-337012	TR 2SA984K D,E
114		ET-337968	TR 2SA999 E,F
115		ET-322598	TR 2SB632K E,F
116		ET-318237	TR 2SB764 E,F
117	N	ET-337188	TR 2SB774 P,Q
118	N	ET-347969	TR 2SB808-V F,G,H
119		ET-336997	TR 2SB808-V G,H
120	N	ET-308976	TR 2SC1815 BL,GR
121	N	ET-337011	TR 2SC2274K D,E
122	N	ET-310833	TR 2SC2274K E
123		ET-328578	TR 2SC2320 E,F
124	N	ET-330270	TR 2SC2320 F,G
125	N	ET-200505	TR 2SC2603 E,F
126	N	ET-200985	TR 2SC2603 F,G
127		ET-3409080	TR 2SC3382 S,T
128		ET-349081	TR 2SC3383 S,T
129		ET-350795	TR 2SC3399
130	N	ET-319638	TR 2SD1012-V F,G,H
131		ET-347961	TR 2SD1012-V G
132	N	ET-328868	TR 2SD1012-V G,H
133		ET-350816	TR 2SD549 E,F
134		ET-350948	TR 2SD612K F
135	N	ET-307349	TR 2SD794 P,Q
136	N	EV-321637	R S-FIX H D8 3P 104
137	N	EV-315414	R S-FIX H D8 3P 203
138	N	EV-315752	R S-FIX H D8 3P 204
139	N	EV-322416	R S-FIX H D8 3P 303
140	N	EV-315413	R S-FIX H D8 3P 503
141		EV-336850	R S-FIX H KVSF807U 3P 202
142		EV-336851	R S-FIX H KVSF807V 3P 501
143		EV-337995	R S-FIX H RVF8P01 3P 103
144		EV-337993	R S-FIX H RVF8P01 3P 203
145		EV-338588	R S-FIX H RVF8P01 3P 503
146		EV-330531	R S-FIX H TM8KV2-1S 3P 0.50W 503
147		EV-325994	R S-FIX V H1052A 3P 0.15W 103
148		EV-345297	R S-FIX V TM8KH1-1S 3P 0.50W 101
149		EV-341250	R S-FIX V TM8KH1-1S 3P 0.50W 503
150		EV-337052	VR ROTARY 16L10XOR B103
151		EV-337840	VR SLIDE 100P2WV0A A503
152		EV-337841	VR SLIDE 30P2SV0A B103
153		HE-H2302A010A	HEAD E E4-11
154		HE-H2303A010A	HEAD E E4-11S
155		HP-H2404A010A	HEAD COMBO RP4-10
156		MB-345193	BELT CAPSTAN F222M
157		MB-345179	BELT GEAR S 80M
158		MB-344989	BELT OPERATION (B) S 128M
159		MI-T2049A030A	IDLER BLK GX-R99
160		MP-336204	ROLLER PINCH (B)
161		MP-344980	ROLLER PINCH (B)
162		MZ-344004	GEAR HEAD
163		MZ-336005	GEAR POTENTION
164		MZ-B345155	GEAR REVERSE PART

NOTE N: NEW PARTS

MECHA CMR02 BLOCK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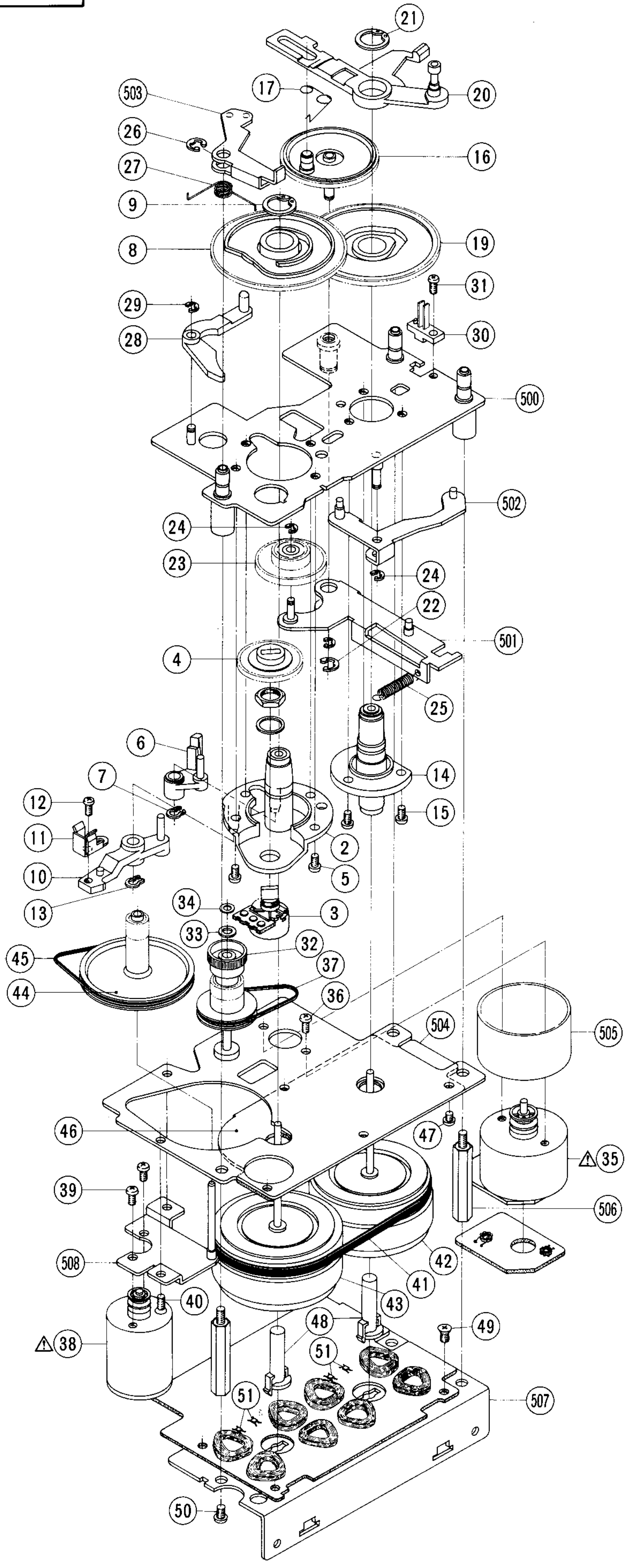
1. MECHA CMR02 BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
1-1	BZ-T2049A020A	MECHA CMR02 BLK GX-R99
	HEAD BLOCK	
1-2	BH-T2049A070A	HEAD BLK GX-R99
1-3	MA-B344940	CHASSIS HEAD PART
1-4	HZ-B344009	HOUSING ROTARY PART
1-5	HP-H2404A010A	HEAD COMBO RP4-10
1-6	HZ-B344006	HOLDER ROTARY PART
1-7	ZS-245147	CTS20×06STL BNI
1-8	HZ-344011	GUIDE ROTARY HEAD
1-9	ZS-344001	SCREW AZIMUTH
1-10	ZW-273734	N20BRS NI3 1
1-11	MZ-344004	GEAR HEAD
1-12	ZG-351688	SP PUSH EH
1-13	ZW-391397	RING E120SUP CMT
1-14	HE-H2302A010A	HEAD E E4-11
1-15	HE-H2303A010A	HEAD E E4-11S
1-16	ZW-618884	N20STL CMT 1
1-17	TC-344942	SLIDE CHANGE
1-18	ZS-481645	BID26×03STL CMT
1-19	ZG-344988	SP TORSION RACK
1-20	ZW-350766B	SPACER ADJUST (B)
1-20	ZW-350766C	SPACER ADJUST (C)
1-20	ZW-350766D	SPACER ADJUST (D)
1-21	ZW-344639G	SPACER ADJUST (G) 0.40MM
1-21	ZW-344639H	SPACER ADJUST (H) 0.45MM
1-21	ZW-344639J	SPACER ADJUST (I) 0.50MM
1-22	HZ-344015	COVER HOUSING
1-23	ZS-345773	BID17×06STL BNI
1-24	ZS-524812	CTS20×04STL CMT
	IDLER BLOCK	
1-25	MI-T2049A030A	IDLER BLK GX-R99
	REEL TABLE BLOCK	
1-26	BR-T2049A040A	REEL TABLE BLK GX-R99
	ARM PINCH ROLLER (R) BLOCK	
1-27	BL-T2049A050A	ARM PINCH ROLLER (R) BLK GX-R99
1-28	MP-344980	ROLLER PINCH (B)
1-29	ZG-349030	SP PUSH GUIDE TAPE HOLDER
1-30	ZW-350890	PW12×032×025PSL
1-31	ZG-349178	SP PULL GUIDE TAPE
	ARM PINCH ROLLER (L) BLOCK	
1-32	BL-T2049A060A	ARM PINCH ROLLER (L) BLK GX-R99
	MECHA CMR02 BLOCK	
1-33	SZ-336166	COLLAR LID
1-34	ML-344949	LEVER BRAKE (A)
1-35	TC-336146	BRAKE RUBBER
1-36	ML-344950	LEVER BRAKE (B)
1-37	ZG-312946	SP T1-3.2/0.29-16.0 T1-062
1-38	ML-B344951	LEVER BT(L) PART
1-39	ZG-344987	SP PULL BT
1-40	ML-B344952	LEVER BT(R) PART
1-41	ZG-349177	SP PULL PINCH ROLLER (L)
1-42	ZG-344985	SP PULL PINCH ROLLER (R)
1-43	ZW-356657	RING E 150SUP CMT
1-44	ML-345073	LEVER BT CHANGE (R)
1-45	ZW-329422	RING CS0300
1-46	ML-345074	LEVER BT CHANGE (L)
1-47	ML-344961	LEVER HEAD BASE (A)
1-48	ML-B344962	LEVER HEAD BASE (B) PART
1-49	ZG-344964	SP TORSION (A)
1-50	ZW-329422	RING CS0300
1-51	ZG-344960	SP TORSION IDLER
1-52	ZG-336141	SP PUSH BT
1-53	TC-336142	HOLDER BT SP
1-54	ZW-330073	PW21×040×020
1-55	MT-305793	REEL CAP
1-56	TC-336161	SLIDE EJECT
1-57	ZW-329422	RING CS0300
1-58	TC-344982	PROP REFARENCE
1-59	ML-344953	LEVER DETECTION (A)
1-60	ML-344954	LEVER DETECTION (B)
1-61	ES-344257	SW LEAF MSW-1418L 01-1 NO
1-62	ES-344253	SW LEAF MSW-1418J 01-1 NO
1-63	ES-344257	SW LEAF MSW-1418L 01-1 NO
1-64	ES-344253	SW LEAF MSW-1418J 01-1 NO
1-65	ML-344955	LEVER DETECTION (C)
1-66	ZG-312996	SP T1-4.0/0.4-14.0 T1-110
1-67	ZS-460440	PAN20×04STL CMT
1-68	ET-345091	PHOTO SENSOR SPI-201-40 B,C
1-69	ES-336990	SW LEAF BSW-169 01-1 NO
1-70	MV-666887	BALL 250STL
1-71	ET-310341	PHOTO SENSOR PT350 T
1-72	HZ-349298	PLATE HEAD HOLDER
1-73	ZS-336613	PT PAN26×06STL CMT
1-74	ZG-349033	SP ARM PINCH ROLLER (R)
1-75	ZG-349034	SP ARM PINCH ROLLER (L)
1-76	ZW-350839	NYLON NUT M3
1-77	ZW-259650	PW30×050×020PBR
1-78	ZW-270088	RING E 190SUP CMT
1-79	SP-336163	LID CASE
1-80	ZG-336615	SP PLATE CASSETTE HOLDER (B)
1-81	BD-B348464	LID DECORATION PART
1-82	ED-337010	D LED SLF201C GRN
1-83	BZ-T2030A110A	OIL CLUTCH BLK GX-F51
1-84	ZW-270088	RING E 190SUP CMT
1-85	ES-337427	SW MICRO SS-01-E
1-86	ZS-310337	PAN20×08STL CMT
1-87	MP-336204	ROLLER PINCH (B)

NOTE: Parts listed in 1 to 87 on the exploded view and parts list are normaly stocked for replacement purpose.
The remaining parts shown in this manual are not normaly stocked, because they are not seldom required for routine service.

MOTOR BLM-500 BLOCK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2. MOTOR BLM-500 BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
2-1	BM-M3105A010A	MOTOR BLM-500
2-2	TC-B345188	HOLDER CAPSTAN (A) PART
2-3	EV-337052	VR ROTARY 16L10XOR B103
2-4	MZ-336005	GEAR POTENTION
2-5	ZS-432843	PAN26×04STL CMT
2-6	BL-B336007X1	LEVER BRAKE CAM (1) PART
2-7	ZW-336603	RING GRIP 285SUP ACP
2-8	MZ-345169	CAM WHEEL
2-9	ZW-336604	RING S930SUP ACP
2-10	BL-B336009	LEVER EJECT CAM PART
2-11	MZ-353158	SP PLATE EJECT
2-12	ZS-477876	PAN20×03STL CMT
2-13	ZW-336603	RING GRIP 285SUP ACP
2-14	TC-B345187	HOLDER CAPSTAN (B) PART
2-15	ZS-432843	PAN26×04STL CMT
2-16	MZ-B345155	GEAR REVERSE PART
2-17	ZG-349029	SP TORSION GEAR REVERSE
2-18	ZW-270088	RING E 190SUP CMT
2-19	MZ-345170	CAM WHEEL (R)
2-20	BL-B345159	LEVER REVERSE PART
2-21	ZW-336604	RING S930SUP ACP
2-22	ZW-270134	RING E500SUP CMT
2-23	MZ-345165	GEAR IDLER
2-24	ZW-270088	RING E 190SUP CMT
2-25	ZG-313002	SP T1-4.0/0.4-25.0 T1-115
2-26	ZW-270123	RING E400SUP CMT
2-27	ZG-344984	SP TORSION (R)
2-28	ML-345173	LEVER RELEASE
2-29	ZW-270088	RING E 190SUP CMT
2-30	ES-336990	SW LEAF BSW-169 01-1 NO
2-31	ZS-460440	PAN20×04STL CMT
2-32	MR-B345184	PULLEY MAIN PART
2-33	ZW-259661	PW30×050×025PSL
2-34	ZW-282407	PUSH WASHER (B)
2-35	BM-B604526	⚠ REEL MOTOR PART
2-36	ZS-592378	PAN26×03STL CMT
2-37	MB-345179	BELT GEAR
2-38	BM-B604527	⚠ MOTOR OPERATION PART
2-39	ZS-592378	PAN26×03STL CMT
2-40	ZS-477887	CTS26×05STL CMT
2-41	MB-345193	BELT CAPSTAN
2-42	BF-B345189	FLYWHEEL (A) PART
2-43	BF-B345190	FLYWHEEL (B) PART
2-44	MR-336019	PULLEY OPERATE
2-45	MB-344989	BELT OPERATION (B)
2-46	EA-345195	PC FG
2-47	ZS-321194	ST PAN26×05STL CMT
2-48	TC-345181	HOLDER THRUST
2-49	ZS-477887	CTS26×05STL CMT
2-50	ZS-422076	PAN30×05STL CMT
2-51	EI-336987	HALL ELEMENT DHD-H150

NOTE: Parts listed in 1 to 51 on the exploded view and parts list are normaly stocked for replacement purpose.
The remaining parts shown in this manual are not normaly stocked, because they are not seldom required for routine service.

3. SYSCON AND TUNING P.C BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
3-1	BA-T2048A050A	PC SYCON TUNING BLK GX-R88

SYSCON AND TUNING P.C BOARD

REF. NO.	PARTS NO.	DESCRIPTION
3-IC1	EI-349145	IC μPD1511C-113
3-IC2	EI-345765	IC LB1292
3-IC3	EI-337228	IC M5218L0
3-IC4to6	EI-336761	IC LA6458S
3-IC7	EI-338238	IC μPD4051BC
3-IC8	EI-347923	IC μPD4071BC
3-IC201	EI-348108	IC μPD1511C-134
3-IC202	EI-352232	IC M5L8049-154P-6
3-IC203	EI-348110	IC M5L8243P
3-IC204,205	EI-337008	IC LC7800
3-IC206to208	EI-337013	IC LB1290
3-IC209	EI-348111	IC LC4071B
3-IC210,211	EI-336761	IC LA6458S
3-IC212to214	EI-338171	IC LC4069UB
3-TR1	ET-200558	TR 2SA1115 E,F
3-TR2to4	ET-349081	TR 2SC3383 S,T
3-TR5	ET-328868	TR 2SD1012-V G,H
3-TR6to11	ET-349081	TR 2SC3383 S,T
3-TR12to17	ET-200505	TR 2SC2603 E,F
3-TR19	ET-308976	⚠ TR 2SC1815 BL,GR
3-TR20,21	ET-310833	TR 2SC2274K E
3-TR29to35	ET-200505	TR 2SC2603 E,F
3-TR37	ET-308976	⚠ TR 2SC1815 BL,GR
3-TR38,39	ET-310833	TR 2SC2274K E
3-TR43	ET-200505	TR 2SC2603 E,F
3-TR44	ET-200558	TR 2SA1115 E,F
3-TR45	ET-328868	TR 2SD1012-V G,H
3-TR46	ET-200505	TR 2SC2603 E,F
3-TR47to49	ET-350795	TR 2SC3399
3-TR54	ET-318237	⚠ TR 2SB764 E,F
3-TR55	ET-322598	⚠ TR 2SB632K E,F
3-TR201to206	ET-319638	TR 2SD1012-V F,G,H
3-TR207	ET-554657	TR 2SA733A P,Q
3-TR209	ET-200505	TR 2SC2603 E,F
3-TR210,211	ET-328868	TR 2SD1-12-V G,H
3-TR212,213	ET-347969	TR 2SB808-V F,G,H
3-TR214,215	ET-200505	TR 2SC2603 E,F
3-TR216	ET-200558	TR 2SA1115 E,F
3-D1	ED-346450	D ZENER H HZ6FA F10 B2
3-D2,3	ED-301911	D SILICON H DS448
3-D4,5	ED-346450	D ZENER H HZ6FA F10 B2
3-D6,7	ED-301911	D SILICON H DS448
3-D8	ED-344280	D SILICON H GMA-01-FY2 F05
3-D9,10	ED-301911	D SILICON H DS448
3-D12	ED-301911	D SILICON H DS448
3-D13to17	ED-346503	D ZENER H HZ20FA F10 2
3-D18	ED-346441	D ZENER H HZ5FA F10 B2
3-D19,20	ED-344280	D SILICON H GMA-01-FY2 F05
3-D201to204	ED-344280	D SILICON H GMA-01-FY2 F05
3-D207	ED-346440	D ZENER H HZ5FA F10 B1
3-D208	ED-301911	D SILICON H DS448
3-D209	ED-344280	D SILICON H GMA-01-FY2 F05
3-D210,211	ED-301911	D SILICON H DS448
3-D212to215	ED-346503	D ZENER H HZ20FA F10 2
3-VR1,2	EV-322416	R S-FIX H D8 3P 303
3-VR3,4	EV-330531	R S-FIX H TM8KV2-1S 3P 0.50W 503
3-VR7	EV-315413	R S-FIX H D8 3P 503
3-VR8	EV-315414	R S-FIX H D8 3P 203
3-VR9to11	EV-321637	R S-FIX H D8 3P 104
3-VR12	EV-315752	R S-FIX H D8 3P 204
3-VR201	EV-321637	R S-FIX H D8 3P 104
3-L1,2	EO-343768	COIL FIX 1 FL09H 391K
3-T1	EO-348101	COIL OSC 2 25-5060-02
3-T2	EO-348100	COIL OSC 1 25-5059-22
3-FL1	EO-315758	COIL TUN 1 100Z-431 100,00KHZ
3-FL2	EO-337055	COIL VARI 1 FE002S 10MH
3-FL3,201	EH-337380	FILTER CE KMFC-1001S 3.580MHZ
3-FL202	EH-347991	OSC CE CSA6.00MS 6MHZ
3-FL203	EH-347992	COMP C CSC300K
3-RL1	EQ-344440	RELAY SIGNAL G2V-282P 2TR 24V
3-VC1	EC-348292	C S-FIX H ECR-BA160N11 12-160
3-FR1,2	ER-331188	⚠ R FUSE ERD2FC S10 1/4W 8R2J
3-FR3,4	ER-348272	⚠ R FUSE ERD2FC S10 1/4W 12R0G
3-SR1	EH-348115	COMP R RKC1/8B3 3.3K J
3-SR2	EH-348117	COMP R RKC1/8B8D 47K J
3-SR3	EH-347938	COMP R M-3744
3-SR5-1,5-2	EH-348114	COMP R RKC1/8B4 47K J
3-SR6-1,6-2	EH-348118	COMP C 05-0056
3-SR7	EH-348119	COMP C 05-0057
3-R38	ER-350688	R MF H 1/4W 222J
3-R146	ER-302157	R MF H 1/4W 512J
3-R201	ER-338235	R MF V 1/4W 1820F
3-R202	ER-347939	R MF V 1/4W 1051F
3-R203	ER-338234	R MF V 1/4W 1331F
3-R204	ER-347940	R MF V 1/4W 2151F
3-R205	ER-347941	R MF V 1/4W 3091F
3-R206	ER-338231	R MF V 1/4W 5361F
3-R208	ER-309788	R MF V 1/4W 1001F
3-C5,8	EC-300193	C EC V F05 NP SM 100M 16DC
3-C11	EC-350679	C COMP V AWS 183J 50DC
3-C13	EC-351996	C COMP V AWS 822J 50DC
3-C15	EC-350680	C COMP V AWS 123J 50DC
3-C17	EC-350679	C COMP V AWS 183J 50DC
3-C18,19	EC-346953	C COMP V AWS 512G 50DC
3-C20	EC-352006	C COMP V AWS 362J 50DC
3-C41	EC-200948	C EC V F05 NP SM 1R0M 50DC
3-C42	EC-307684	C EC V F05 NP SM R47M 50DC
3-C47	EC-348293	C PP V F10 ECQ-F 122J 630DC
3-C48	EC-328774	C STY V SNP CQFS 331J 250DC
3-C49	EC-348273	C STY V S05 CQFS 121J 250DC
3-C53	EC-201021	C STY V F05 CQF09 151J 250DC
3-C55	EC-352006	C COMP V AWS 362J 50DC
3-C57	EC-352007	C COMP V AWS 162J 50DC

REMOTE CONTROL P.C BOARD

REF. NO.	PARTS NO.	DESCRIPTION
3-J5	EJ-344282	DIN J TCS1891-01-1011 P 8P

4. PRE AMP IC P.C BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
4-1	BA-T2048A080A	PC PRE AMP IC BLK GX-R88 (IC58)
	PRE AMP P.C BOARD	
4-IC1	EI-349196	IC HA12058
4-IC2	EI-348701	IC M51143L
4-IC3	EI-307644	IC NJM4556D
4-IC5,6	EI-336761	IC LA6458S
4-IC7	EI-337126	IC TA7332P
4-IC8	EI-336761	IC LA6458S
4-IC9	EI-337360	IC μPC4082C
4-IC10	EI-349196	IC HA12058
4-TR1	ET-330270	TR 2SC2320 F,G
4-TR2	ET-321016	TR FET 2SK117 GR,BL
4-TR3	ET-307349	⚠ TR 2SD794 P,Q
4-TR4	ET-330270	⚠ TR 2SC2320 F,G
4-TR5	ET-350806	⚠ TR 2SA1115 F,G
4-TR6	ET-330270	TR 2SC2320 F,G
4-TR7	ET-349081	TR 2SC3383 S,T
4-TR8	ET-349718	TR 2SA1392 S,T
4-TR9to11	ET-341400	TR FET 2SK170 BL,GR
4-TR12	ET-350795	TR 2SC3399
4-TR13	ET-348950	TR 2SA1345
4-TR14	ET-349081	TR 2SC3383 S,T
4-TR15	ET-348950	TR 2SA1345
4-TR16	ET-330270	TR 2SC2320 F,G
4-TR17	ET-348950	TR 2SA1345
4-TR18	ET-350795	TR 2SC3399
4-TR19to22	ET-330270	TR 2SC2320 F,G
4-TR23	ET-350795	TR 2SC3399
4-TR24	ET-348950	TR 2SA1345
4-TR25	ET-350795	TR 2SC3399
4-TR26	ET-348950	TR 2SA1345
4-TR27	ET-330270	TR 2SC2320 F,G
4-TR28	ET-337238	TR FET 2SK270 GR,BL
4-TR29	ET-349081	TR 2SC3383 S,T
4-TR30	ET-337112	TR 2SA798 F,G
4-TR31,32	ET-349080	TR 2SC3382 S,T
4-TR33	ET-349725	TR 2SA1391 S,T
4-TR34	ET-349080	⚠ TR 2SC3382 S,T
4-TR35	ET-349725	⚠ TR 2SA1391 S,T
4-TR36	ET-330270	TR 2SC2320 F,G
4-TR37	ET-349081	TR 2SC3383 S,T
4-D1	ED-346493	D ZENER H HZ15FA F10 2
4-D2to4	ED-344280	D SILICON H GMA-01-FY2 F05
4-D5	ED-346478	D ZENER H HZ11FA F10 B2
4-D6	ED-346633	D SILICON W03B F10 100/1.0A
4-D7to10	ED-344280	D SILICON H GMA-01-FY2 F05
4-D11,12	ED-308952	D GERMA V 1K34A-LR F07
4-D13,15	ED-344280	D SILICON H GMA-01-FY2 F05
4-D16,17	ED-200468	D SILICON V DS448-VB6
4-VR2	EV-337995	R S-FIX H RVF8P01 3P 103
4-VR3	EV-337993	R S-FIX H RVF8P01 3P 203
4-VR4	EV-345297	R S-FIX V TM8KH1-1S 3P 0.50W 101
4-VR5	EV-338588	R S-FIX H RVF8P01 3P 503
4-VR6	EV-325994	R S-FIX V H1052A 3P 0.15W 103
4-VL1	EO-331280	COIL VARI 1 46-1072-11 22MH
4-FL1	EH-336776	FILTER DB D07003K 100KHZ
4-FL2	EH-336775	FILTER DB D07001K 19KHZ
4-FL3	EO-336738	COIL TUN 1 102AZ-004 19.80KHZ
4-FL4	EH-336776	FILTER DB D07003K 100KHZ
4-FL5	EO-336738	COIL TUN 1 102AZ-004 19.80KHZ
4-FR1	ER-350808	⚠ R FUSE ERQ14AJ S10 1/4W 181J
4-R108	ER-338183	R MF H 1/4W 104J
4-R111,112	ER-347958	R MF H 1/4W 272J
4-R113,114	ER-348130	R MF H F10 1/4W 47R0G
4-R116	ER-347959	R MF H 1/4W 561J
4-R117	ER-302156	R MF H 1/4W 472J
4-R121,122	ER-347957	R MF H 1/4W 133J
4-R124	ER-347957	R MF H 1/4W 133J
4-C2	EC-351992	C COMP V AWS 472J 50DC
4-C8	EC-338506	C COMP V AWS 103J 50DC
4-C9	EC-350679	C COMP V AWS 183J 50DC
4-C14	EC-351992	C COMP V AWS 472J 50DC
4-C15	EC-351993	C COMP V AWS 562J 50DC
4-C16	EC-351992	C COMP V AWS 472J 50DC
4-C20	EC-351995	C COMP V AWS 823J 50DC
4-C31to33	EC-345655	C PP V F05 PP 223J 50DC
4-C64	EC-351993	C COMP V AWS 562J 50DC
4-C65	EC-341409	C COMP V AWS 6801G 50DC
4-C70	EC-352009	C COMP V AWS 113J 50DC
4-C71	EC-351994	C COMP V AWS 152J 50DC
4-C72	EC-351997	C PP V F05 PP 121J 50DC
4-C73	EC-347471	C PP V F05 PP 471J 50DC
4-C74	EC-351997	C PP V F05 PP 121J 50DC
4-C81	EC-344486	C PP V F05 PP 391J 50DC
4-C84	EC-318314	C COMP AWS 333J 50DC
4-C85	EC338506	C COMP V AWS 103J 50DC
4-C87	EC-350679	C COMP V AWS 183J 50DC
4-C92,03	EC-351992	C COMP V AWS 472J 50DC
4-C94	EC-351993	C COMP V AWS 562J 50DC
4-C98	EC-351995	C COMP V AWS 823J 50DC
4-PJ1	EJ-351899	PIN J YKC21-5078 P 4P
	HEAD PHONE P.C BOARD	
4-J5	EJ-348160	PHONE J HLJ0540-040 6.3
	SWITCH P.C BOARD	
4-SW1	ES-348133	SW PUSH ESB-62746 3 THROW
	OUT VOLUME P.C BOARD	
4-VR1	EV-337841	VR SLIDE 30P2SV0A B103
	REC VOLUME P.C BOARD	
4-VR7	EV-337840	VR SLIDE 100P2WV0A A503

5. METER P.C BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
5-1	BA-T2048A060A	PC METER BLK GX-R88
	METER P.C BOARD	
5-IC1to4	EI-348105	IC HA12010
5-D1,2	ED-348121	D LED TLG143 GRN
5-D3,4	ED-348122	D LED TLY143 YLW
5-SW1,2	ES-346260	SW PUSH SPH121A 2-02-02N
5-SW3to20	ES-336780	SW TACT KHH10902
5-IN1	EM-347978	IND FL BG-167Z
5-R1	ER-346175	R MF H F10 1/4W 2001F
5-R2	ER-349158	R MF H F10 1/4W 3001F

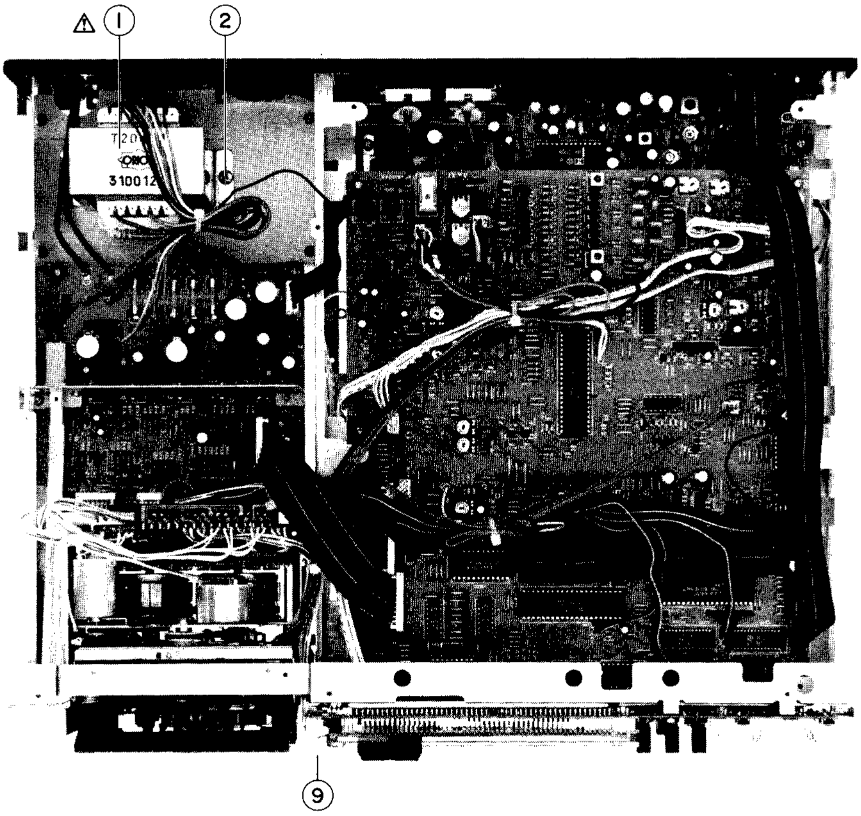
6. POWER SUPPLY P.C BOARD BLOCK

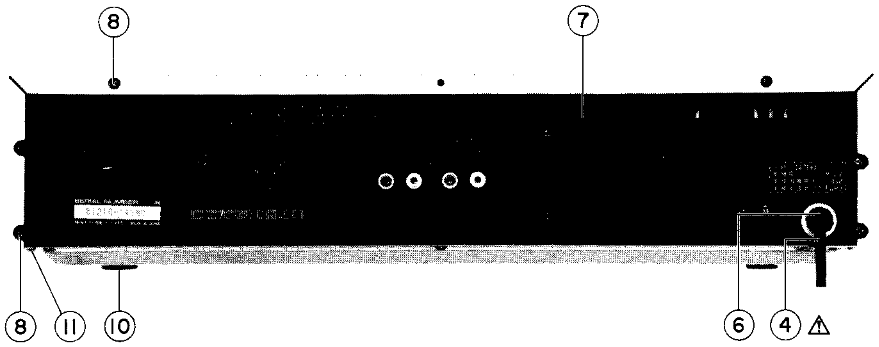
REF. NO.	PARTS NO.	DESCRIPTION
6-1U	BA-T2048A030A	PC POWER BLK GX-R88 (U)
6-1J	BA-T2048A030B	PC POWER BLK GX-R88 (J)
6-1C	BA-T2048A030C	PC POWER BLK GX-R88 (C,A)
6-1E	BA-T2048A030D	PC POWER BLK GX-R88 (E,V,B,S)
	POWER SUPPLY P.C BOARD	
6-IC1	EI-348123	IC M5230AL
6-IC2	EI-337529	⚠ IC TA78L005AP
6-IC4	EI-330352	IC BA6109
6-TR1	ET-337188	⚠ TR 2SB774 P,Q
6-TR2	ET-307349	⚠ TR 2SD794 P,Q
6-TR3	ET-328578	⚠ TR 2SC2320 E,F
6-TR4	ET-337968	TR 2SA999 E,F
6-TR5	ET-350816	⚠ TR 2SD549 E,F
6-TR6	ET-322598	⚠ TR 2SB632K E,F
6-TR7	ET-200505	⚠ TR 2SC2603 E,F
6-TR8	ET-200505	TR 2SC2603 E,F
6-TR9	ET-554657	TR 2SA733A P,Q
6-TR10	ET-350948	⚠ TR 2SD612K F
6-TR11,12	ET-336997	TR 2SB808-V G,H
6-TR13,14	ET-347961	⚠ TR 2SD1012-V G
6-TR15,16	ET-336997	TR 2SB808-V G,H
6-TR17	ET-200505	TR 2SC2603 E,F
6-TR18	ET-328868	TR 2SD1012-V G,H
6-TR19	ET-200985	TR 2SC2603 F,G
6-TR20	ET-200505	TR 2SC2603 E,F
6-D1	ED-330987	⚠ D SILICON RB152 200/1.5A
6-D2,3	ED-33-319	⚠ D SILICON DBA10B 100/1.0A
6-D4	ED-330622	⚠ D SILICON 1SR35-100VL 100/1.0A
6-D5	ED-346505	D ZENER H HZ22FA F10 1
6-D6	ED-346454	D ZENER H HZ6FA F10 C3
6-D7,8	ED-624903	D SILICON H 1S2473
6-D9	ED-346473	D ZENER H HZ9FA F10 C3
6-D11	ED-624903	D SILICON H 1S2473
6-D12	ED-346462	D ZENER H HZ7FA F10 C2
6-D13	ED-346452	D ZENER H HZ6FA F10 C1
6-D14	ED-346446	D ZENER H HZ5FA F10 C3
6-D15to18	ED-330622	D SILICON 1SR35-100VL 100/1.0A
6-VR1	EV-336851	R S-FIX H KVSF807V 3P 501
6-SW1	ES-348998	⚠ SW PUSH SDL1P 01-1
6-FR1	ER-318248	⚠ R FUSE ERD2FC S10 1/4W 47R0G
6-R1,2	ER-347952	⚠ R OMF H S15 FS 1W 331J
6-R11	ER-352000	R OMF H SI5 FS 1W 332J
6-R38	ER-337755	R OMF H S20 FS 2W 222J
6-C1,2	EC-324664	C EC V CUT USM 222M 25.0DC
6-C4	EC-352001	C STY V CUT CQ09S2B 471J 125DC
6-C16	EC-201761	C EC V CUT USM 472M 16.0DC
6-C24	EC-316186	C EC V CUT SM 222M 16.0DC
6-C30U	EC-337681	⚠ C MMY V ECQEW 223M 250AC (U)
6-C30J	EC-350949	⚠ C MMY V ECQ-E 223M 250DC (J)
6-C30C	EC-338397	⚠ C MMY V ECQUE 223M 125AC (C,A)
6-C30W	EC-338399	⚠ C MMY V ECQUF 223M 250AC (E,V,B,S)
6-F1Uto3U	EF-309387	⚠ FUSE TSC A 250V 1.00A(U,J)
6-F4U	EF-311839	⚠ FUSE TSC A 250V 1.60A(U,J)
6-F5J	EF-306124	⚠ FUSE TSC A 250V 0.63A (J)
6-F1Cto3C	EF-310229	⚠ FUSE TSC 125V 1.00A (C,A)
6-F4C	EF-308847	⚠ FUSE TSC 125V 1.60A (C,A)
6-F5C	EF-305703	⚠ FUSE TSC 125V 0.63A (C,A)
6-F1Eto3E	EF-623103	⚠ FUSE SEMKO T 250V 1.00A (E,V,B,S)
6-F4E	EF-601964	⚠ FUSE SEMKO T 250V 1.60A (E,V,B,S)
6-F5E	EF-601942	⚠ FUSE SEMKO T 250V 0.63A (E,V,B,S)

7. MOTOR P.C BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
	MOTOR P.C BOARD	
7-IC1A,2A	EI-201940	IC NJM4558S
7-TR1A	ET-337011	TR 2SC2274K D,E
7-TR2A	ET-337012	TR 2SA984K D,E
7-TR3A	ET-337011	TR 2SC2274K D,E
7-TR4A	ET-337012	TR 2SA984K D,E
	SERVO P.C BOARD	
7-IC1B	EI-336992	IC μPC1043C
7-IC2B	EI-310036	IC TC4066BP
7-IC3B	EI-201940	IC NJM4558S
7-TR1B	ET-200505	TR 2SC2603 E,F
7-TR2B	ET-337011	TR 2SC2274K D,E
7-TR3B	ET-337012	TR 2SA984K D,E
7-TR4B	ET-337011	TR 2SC2274K D,E
7-TR5B	ET-337012	TR 2SA984K D,E
7-D1Bto4B	ED-348001	D ZENER V HZ2B-1S7
7-D5B	ED-338082	D ZENER V HZ5C-1S7
7-VR1B	EV-341250	R S-FIX V TM8KH1-1S 3P 0.50W 503
7-VR2B,3B	EV-336850	R S-FIX H KVSF807U 3P 202
7-R5B	ER-323487	R MF H F10 1/4W 1503F
7-R22B	ER-333703	R CB H S15 FS RDS 1/2W 911J
7-C4B	EC-347590	C COMP V AWS 273J 50DC

ASSEMBLY BLOCK



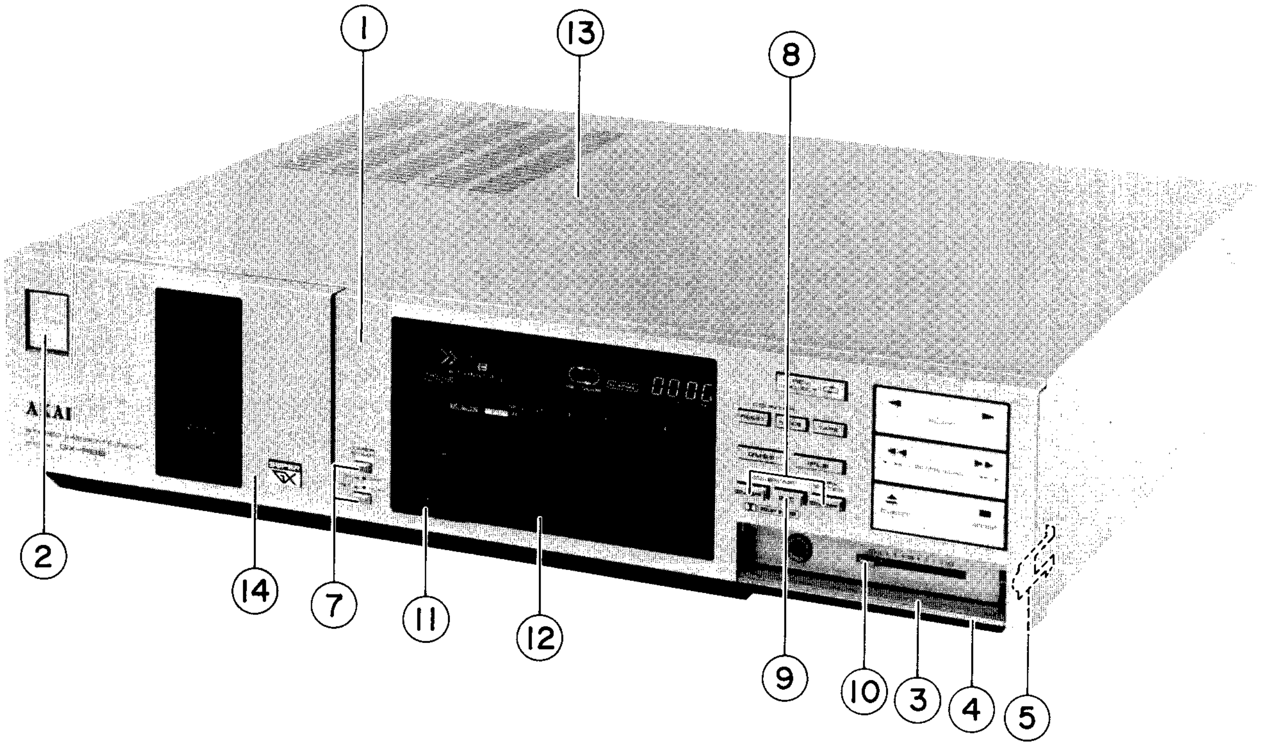


8. ASSEMBLY BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
	TRANS POWER BLOCK	
8-1U	BT-347970	⚠ TRANS POWER T2048U
8-1J	BT-347971	⚠ TRANS POWER T2048J
8-1A	BT-347972	⚠ TRANS POWER T2048AC
8-1E	BT-347973	⚠ TRANS POWER T2048EV
8-1B	BT-347974	⚠ TRANS POWER T2048BS
8-2	ZS-301398	ST BID40×08STL CMT
8-3x	ZW-413188	N40STL CMT 1
8-4U	EW-374894	AC CORD 2 CORES VM-0129A,VFF U/T (U)
8-4J	Ew-351961	AC CORD 2 CORES KP-211 VFF J (J)
8-4C	EW-207742	AC CORD 2 CORES VM-0238, SPT-1 UC (C,A)
8-4E	EW-347897	AC CORD 2 CORES VM0364,LCFL EV (E,V)
8-4B	EW-347828	AC NR BS 42/0.15×2 EV (B)
8-4S	EW-347898	AC CORD 2 CORES VM-0436, LCFL S (S)

REF. NO.	PARTS NO.	DESCRIPTION
8-5Ux	ES-305733	⚠ SW SELECTOR HXW0131-260 01-4 (U)
8-6U	EZ-631945	STRAIN RELIEF SR-4N-4 (U,J,C,A,E,V,S)
8-6B	EJ-692908	STRAIN RELEIF SR-5N-4 (B)
	ASSEMBLY BLOCK	
8-7U	SP-345237G	PANEL REAR GX-R88(U)
8-7J	SP-345237H	PANEL REAR GX-R88 (J)
8-7C	SP-345237J	PANEL REAR GX-R88 (C,A)
8-7E	SP-345237L	PANEL REAR GX-R88 (E)
8-7V	SP-345237N	PANEL REAR GX-R88 (V)
8-7B	SP-345237M	PANEL REAR GX-R88 (B,S)
8-8	ZS-345272	ST BR30×06STL BNI
8-9	ZG-350793	SP EARTH
8-10	SA-349332	FOOT
8-11	ZS-320906	ST BR30×06STL CMT
8-12x	ZW-305013	RV POP32 (A)

FINAL ASSEMBLY BLOCK



9. FINAL ASSEMBLY BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
9-1S	BD-T2048A070A	PANEL FRONT BLK GX-R88
9-1P	BD-T2048A070B	PANEL FRONT BLK GX-R88-P
9-1B	BD-T2048A070C	PANEL FRONT BLK GX-R88-B
9-2S	SK-B345231A	KNOB POWER PART
9-2P	SK-B345231B	KNOB POWER-P PART
9-2B	SK-B345231C	KNOB POWER-B PART
9-3	SP-345228B	DOOR PHONE-P
9-3B	SP-345228C	DOOR PHONE-B
9-4S	SP-345226A	PANEL PHONE
9-4P	SP-345226B	PANEL PHONE-P
9-4B	SP-345226C	PANEL PHONE-B
9-5	TP-345229	HINGE DOOR
9-6S	MB-330911	CUSHION RUBBER
9-6P	MB-330911B	CUSHION RUBBER (BL)
9-7S	SK-351574A	KNOB TIMER
9-7P	SK-351574B	KNOB TIMER-P
9-7B	SK-351574C	KNOB TIMER-B
9-8S	SK-B345233A1	KNOB DOLBY-1 PART
9-8P	SK-B345233A3	KNOB DOLBY-1P PART
9-8B	SK-B345233A4	KNOB DOLBY-1B PART
9-9S	SK-B345233A2	KNOB DOLBY-2 PART
9-9P	SK-B345233A5	KNOB DOLBY-2P PART
9-9B	SK-B345233A6	KNOB DOLBY-2B PART
9-10S	SK-343009D	KNOB OUTPUT-S
9-10P	SK-343009B	KNOB OUTPUT-P
9-10B	SK-343009C	KNOB OUTPUT-B
9-11,11B	SK-B345271	KNOB REC PART
9-12	TP-345269	SCALE
9-13S	BC-345243A	COVER UPPER
9-13P	BC-345243B	COVER UPPER-P
9-13B	BC-345243C	COVER UPPER-B
9-14S	BD-B345247D	LID PANEL GX-R88 PART
9-14P	BD-B345247E	LID PANEL GX-R88-P PART
9-14B	BD-B345247F	LID PANEL GX-R88-B PART

SYMBOL FOR COLOR VARIATION

S – SILVER
P – PEARL SHADOW
B – BLACK

INDEX

PARTS NO.	REF. NO.
BA-T2048A030A	6-1U
BA-T2048A030B	6-1J
BA-T2048A030C	6-1C
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BA-T2048A050A	3-1
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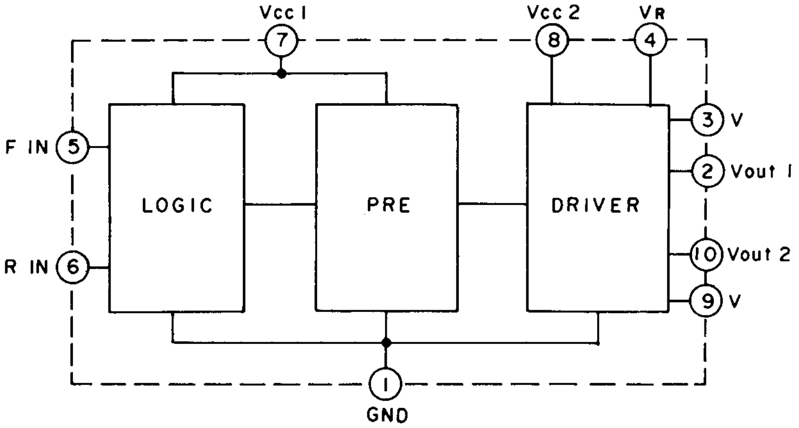
AKAI

MODEL GX-R88

P.C BOARDS
SCHEMATIC DIAGRAM

BA6109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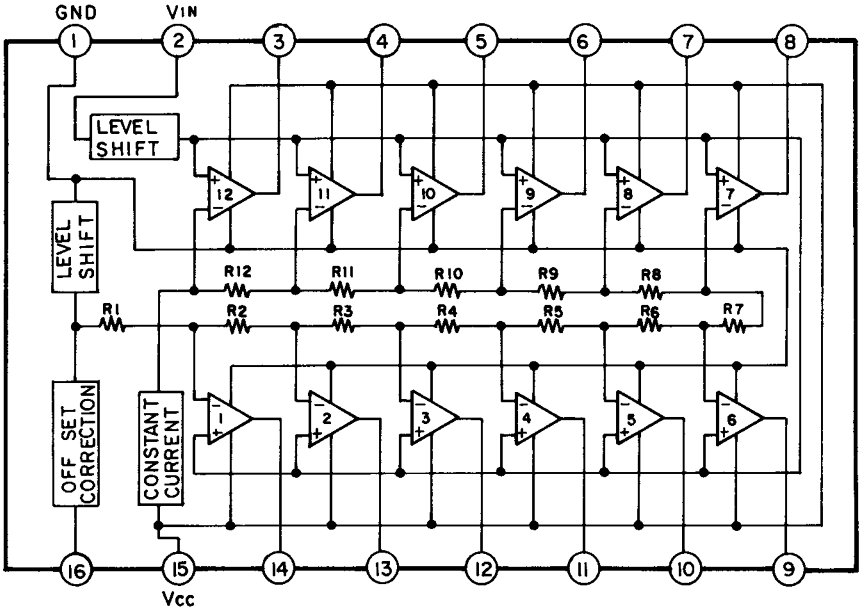
HA12010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R9
R10
R11
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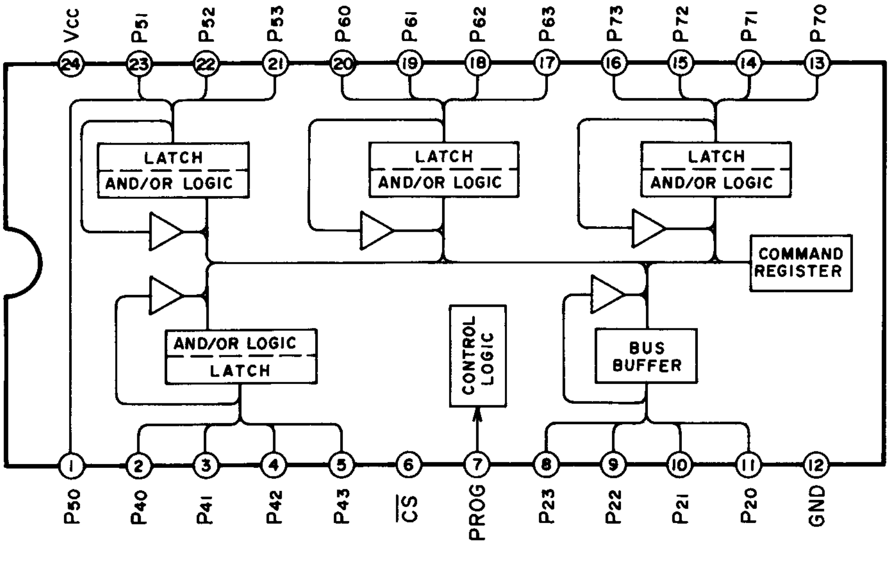
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LATCH
AND/OR LOGIC
LATCH
AND/OR LOGIC
COMMAND REGISTER
AND/OR LOGIC
LATCH
CONTROL LOGIC
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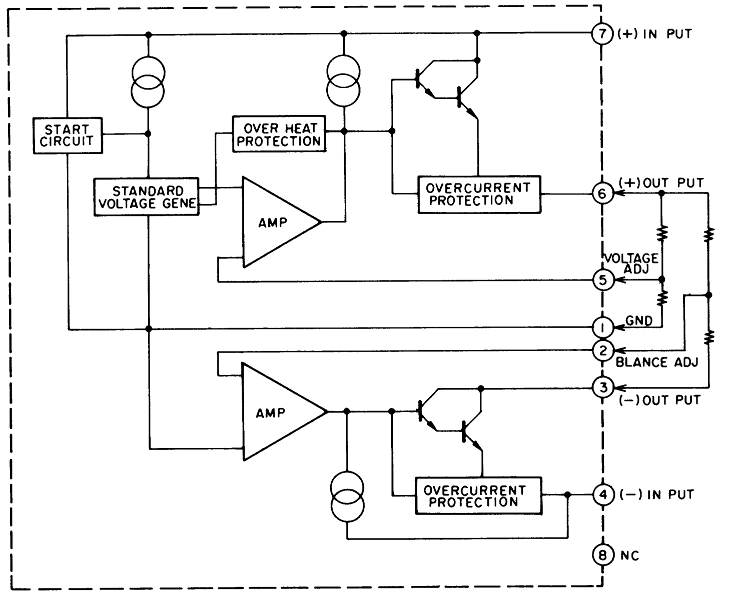
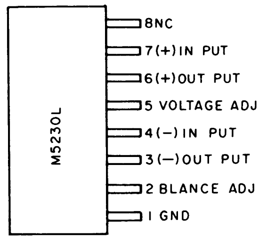
M5230AL

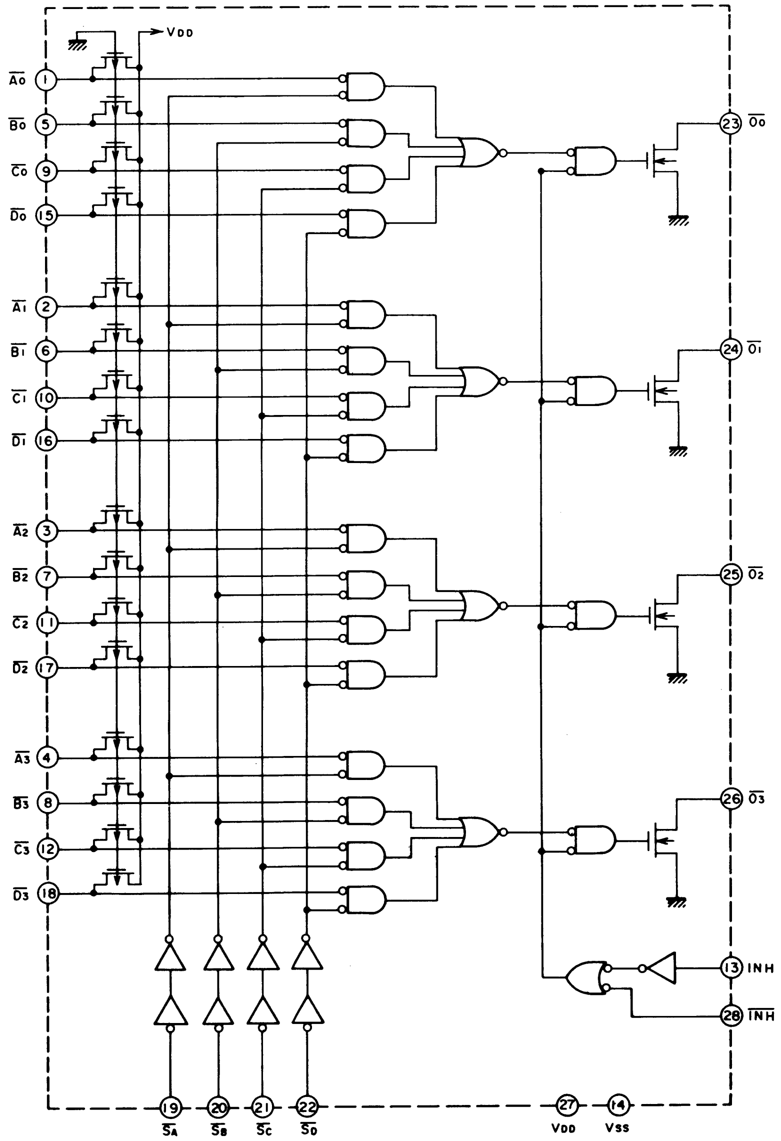


START CIRCUIT
STANDARD VOLTAGE GENE
OVER HEAT PROTECTION
AMP
OVERCURRENT PROTECTION
AMP
OVERCURRENT PROTECTION
7 (+) IN PUT
6 (+)OUT PUT
5 VOLTAGE ADJ
1 GND
2 BLANCE ADJ
3 (−)OUT PUT
4 (−) IN PUT
8 NC



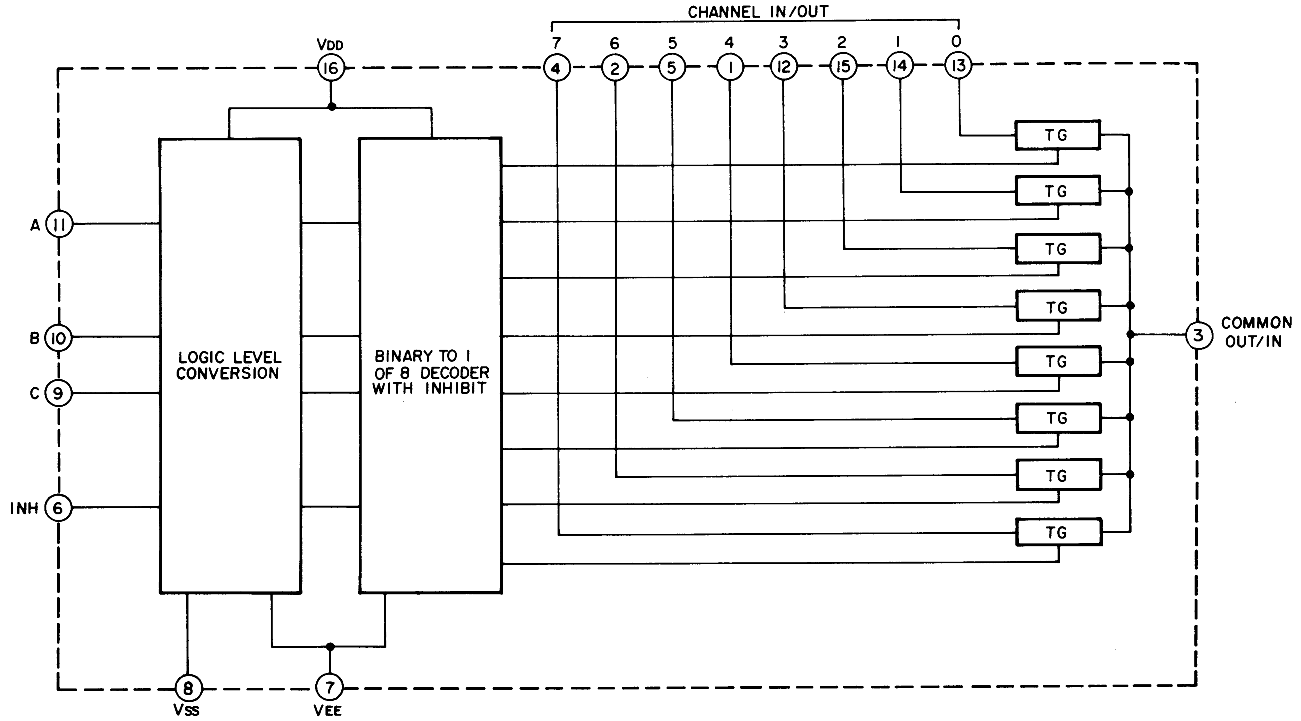
M5230L
8NC
7(+)IN PUT
6(+)OUT PUT
5 VOLTAGE ADJ
4(−)IN PUT
3(−)OUT PUT
2 BLANCE ADJ
1 GND

LC7800



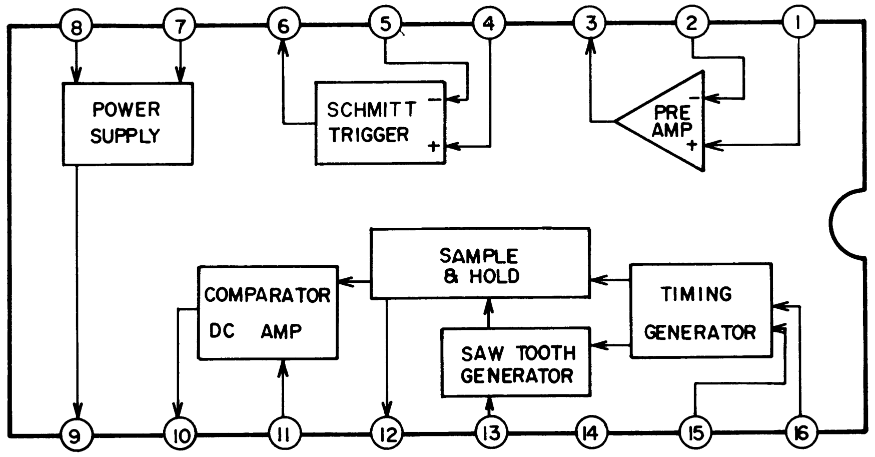
VDD
$\overline{A_0}$ 1
$\overline{B_0}$ 5
$\overline{C_0}$ 9
$\overline{D_0}$ 15
$\overline{A_1}$ 2
$\overline{B_1}$ 6
$\overline{C_1}$ 10
$\overline{D_1}$ 16
$\overline{A_2}$ 3
$\overline{B_2}$ 7
$\overline{C_2}$ 11
$\overline{D_2}$ 17
$\overline{A_3}$ 4
$\overline{B_3}$ 8
$\overline{C_3}$ 12
$\overline{D_3}$ 18
23 $\overline{O_0}$
24 $\overline{O_1}$
25 $\overline{O_2}$
26 $\overline{O_3}$
13 INH
28 $\overline{INH}$
19 $\overline{S_A}$
20 $\overline{S_B}$
21 $\overline{S_C}$
22 $\overline{S_D}$
27 VDD
14 VSS

µPD4051BC

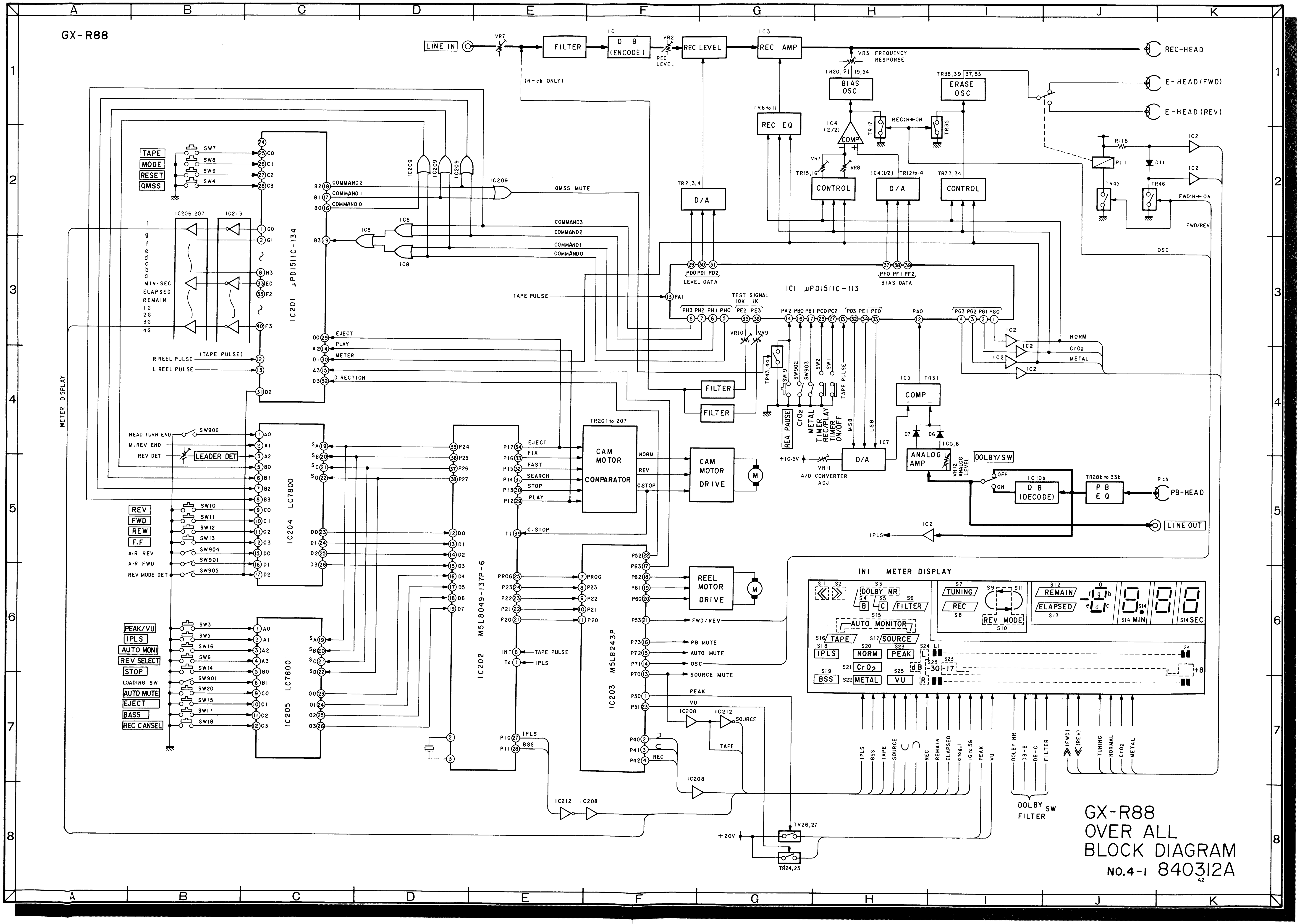


CHANNEL IN/OUT
7 6 5 4 3 2 1 0
VDD 16
4 2 5 1 12 15 14 13
A 11
B 10
C 9
INH 6
LOGIC LEVEL CONVERSION
BINARY TO 1 OF 8 DECODER WITH INHIBIT
TG
TG
TG
TG
TG
TG
TG
TG
3 COMMON OUT/IN
8 VSS
7 VEE

µPC1043C

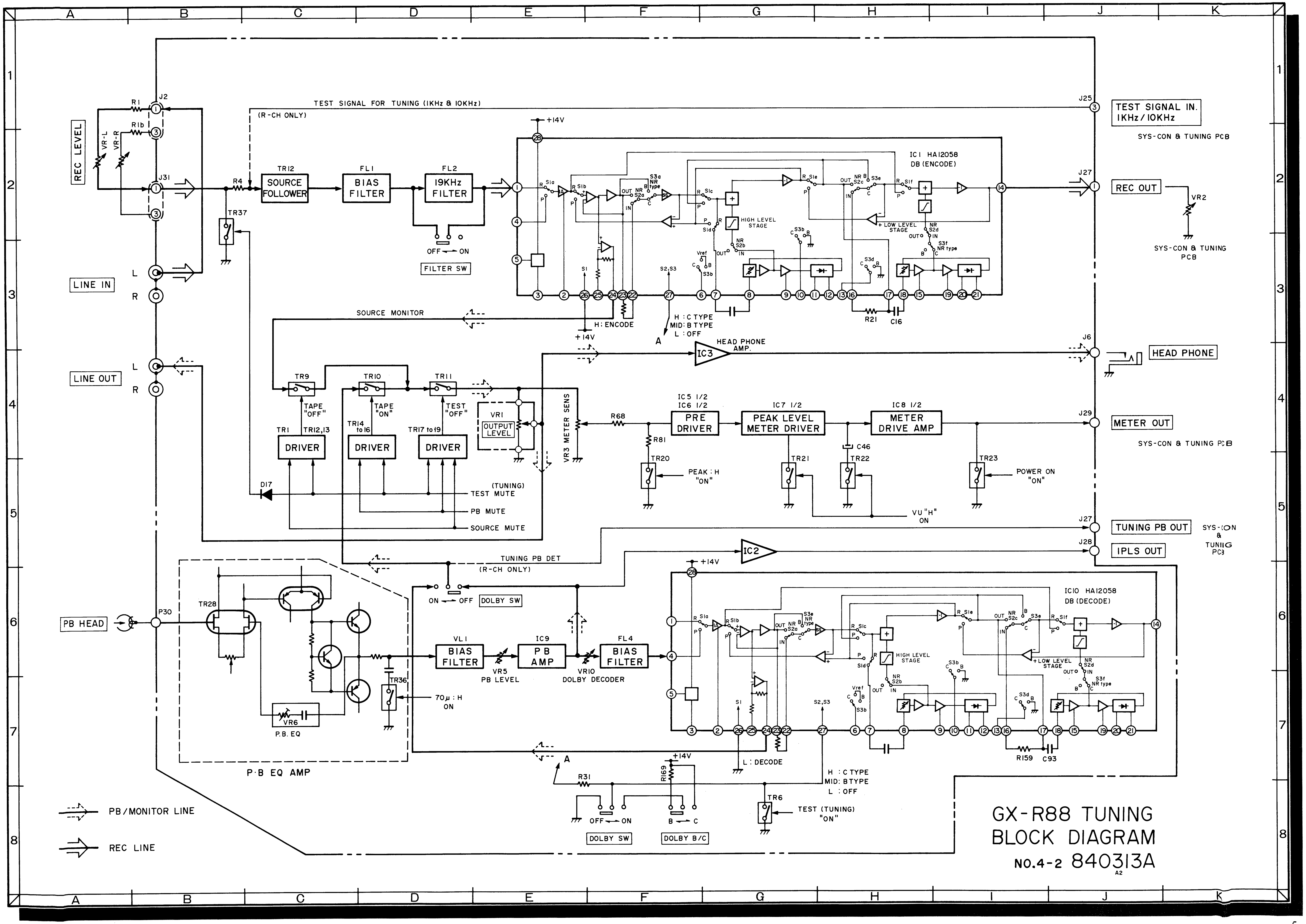


8 7 6 5 4 3 2 1
POWER SUPPLY
SCHMITT TRIGGER
PRE AMP
SAMPLE & HOLD
COMPARATOR DC AMP
TIMING GENERATOR
SAW TOOTH GENERATOR
9 10 11 12 13 14 15 16


GX-R88
LINE IN
VR7
(R-ch ONLY)
FILTER
IC1
D B (ENCODE)
VR2
REC LEVEL
REC LEVEL
IC3
REC AMP
VR3 FREQUENCY RESPONSE
REC-HEAD
E-HEAD (FWD)
E-HEAD (REV)
TR20, 21 19, 54
BIAS OSC
TR38, 39 37, 55
ERASE OSC
TR6 to 11
REC EQ
IC4 (2/2)
COMP
TR17
REC:H→ON
TR35
VR7
VR8
TR15, 16
CONTROL
IC4 (1/2)
TR12 to 14
D/A
TR33, 34
CONTROL
R118
RL1
D11
IC2
TR45
TR46
FWD:H→ON
FWD/REV
OSC
TR2, 3, 4
D/A
TAPE
MODE
RESET
QMSS
SW7
SW8
SW9
SW4
IC206, 207
IC213
MIN·SEC
ELAPSED
REMAIN
1G
2G
3G
4G
IC201 μPD1511C-134
IC209
COMMAND2
COMMAND1
COMMAND0
QMSS MUTE
IC8
COMMAND3
COMMAND2
COMMAND1
COMMAND0
EJECT
PLAY
METER
DIRECTION
R REEL PULSE
L REEL PULSE
(TAPE PULSE)
TAPE PULSE
IC1 μPD1511C-113
P00 P01 P02
LEVEL DATA
PF0 PF1 PF2
BIAS DATA
TEST SIGNAL 10K 1K
PA1
PH3 PH2 PH1 PH0
PE2 PE3
PA2 PB0 PB1 PC0 PC2
P03 PE1 PE0
PA0
PG3 PG2 PG1 PG0
VR10
VR9
TR43, 44
SW19
SW902
SW903
SW2
SW1
TAPE PULSE
REA PAUSE
CrO2
METAL
TIMER REC/PLAY
TIMER ON/OFF
MSB
LSB
NORM
CrO2
METAL
FILTER
FILTER
IC5
TR31
COMP
D7
D6
IC5, 6
ANALOG AMP
VR12 ANALOG LEVEL
+10.5V
VR11
A/D CONVERTER ADJ.
IC7
D/A
DOLBY/SW
OFF
ON
IC10b
D B (DECODE)
TR28b to 33b
P B E Q
R ch
PB-HEAD
LINE OUT
IPLS
METER DISPLAY
HEAD TURN END
M.REV END
REV DET
LEADER DET
SW906
IC204 LC7800
REV
FWD
REW
F.F
A·R REV
A·R FWD
REV MODE DET
SW10
SW11
SW12
SW13
SW904
SW901
SW905
PEAK/VU
IPLS
AUTO MONI
REV SELECT
STOP
LOADING SW
AUTO MUTE
EJECT
BASS
REC CANSEL
SW3
SW5
SW16
SW6
SW14
SW901
SW20
SW15
SW17
SW18
IC205 LC7800
IC202 M5L8049-137P-6
TR201 to 207
EJECT
FIX
FAST
SEARCH
STOP
PLAY
CAM MOTOR COMPARATOR
NORM
REV
C.STOP
CAM MOTOR DRIVE
M
C.STOP
IC203 M5L8243P
PROG
REEL MOTOR DRIVE
M
FWD/REV
PB MUTE
AUTO MUTE
OSC
SOURCE MUTE
PEAK
VU
IC208
IC212
SOURCE
TAPE
REC
INT
TAPE PULSE
IPLS
IPLS
BSS
IC212
IC208
IC208
+20V
TR26, 27
TR24, 25
IN1 METER DISPLAY
DOLBY NR
B
C
FILTER
TUNING
REC
REV MODE
REMAIN
ELAPSED
MIN
SEC
AUTO MONITOR
TAPE
SOURCE
IPLS
NORM
PEAK
CrO2
BSS
METAL
VU
dB
-30
-17
+8
L
R
IPLS
BSS
TAPE
SOURCE
REC
REMAIN
ELAPSED
dlog,l
1G to 5G
PEAK
VU
DOLBY NR
DB-B
DB-C
FILTER
(FWD)
(REV)
TUNING
NORMAL
CrO2
METAL
DOLBY SW
FILTER
A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6
7
8
A2

GX-R88 OVER ALL BLOCK DIAGRAM

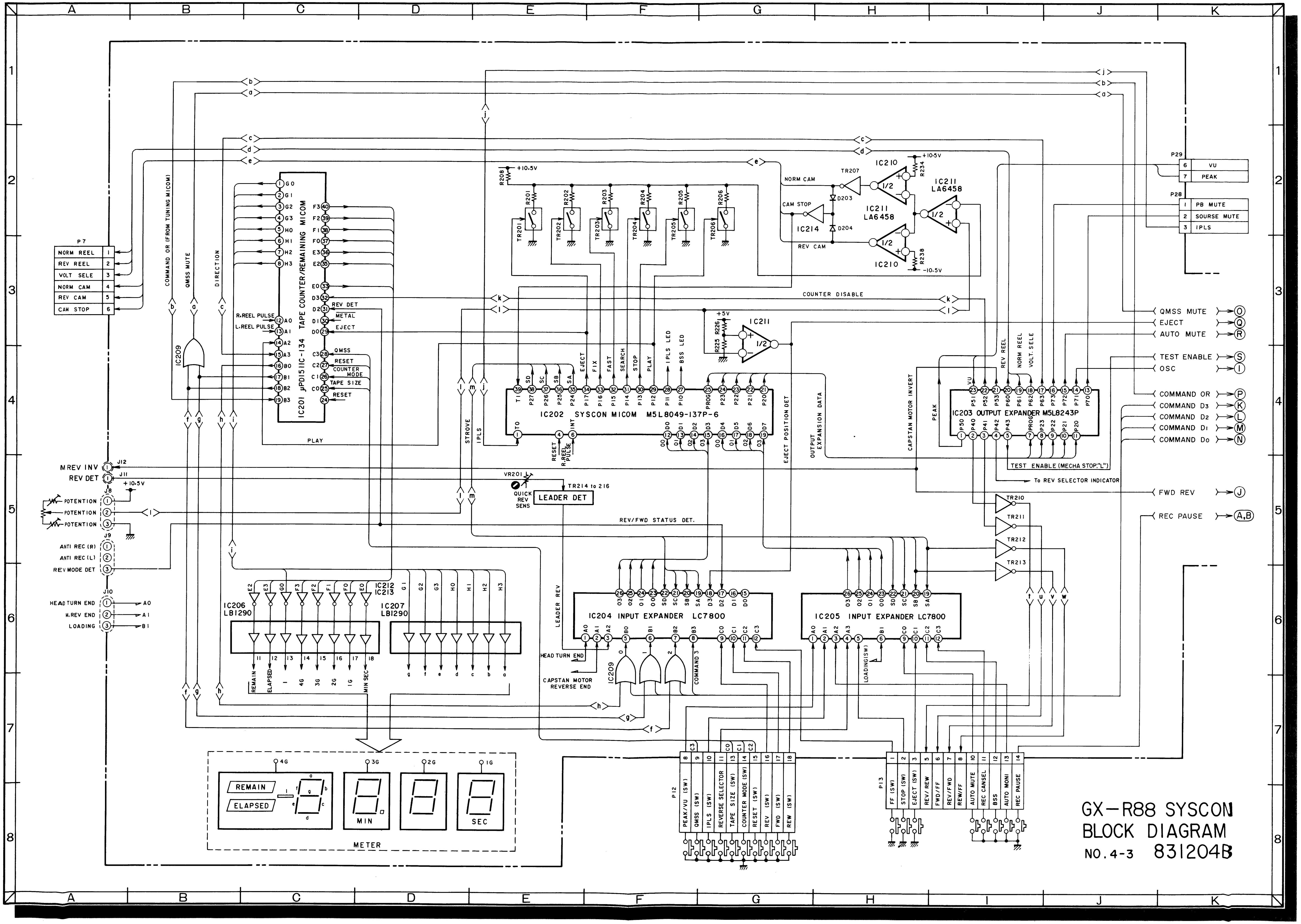
NO.4-1 840312A


A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6
7
8
REC LEVEL
VR-L
VR-R
R1
R1b
J2
J31
LINE IN
L
R
LINE OUT
PB HEAD
P30
TEST SIGNAL FOR TUNING (1KHz & 10KHz)
(R-CH ONLY)
R4
TR37
TR12
SOURCE FOLLOWER
FL1
BIAS FILTER
FL2
19KHz FILTER
OFF ← ON
FILTER SW
+14V
IC1 HA12058
DB (ENCODE)
HIGH LEVEL STAGE
LOW LEVEL STAGE
NR type
H: ENCODE
H: C TYPE
MID: B TYPE
L: OFF
R21
C16
J25
TEST SIGNAL IN.
1KHz/10KHz
SYS-CON & TUNING PCB
J27
REC OUT
VR2
SOURCE MONITOR
HEAD PHONE AMP.
IC3
J6
HEAD PHONE
TR9
TR10
TR11
TAPE "OFF"
TAPE "ON"
TEST "OFF"
TR1
TR12,13
TR14 to16
TR17 to19
DRIVER
DRIVER
DRIVER
VR1
OUTPUT LEVEL
VR3 METER SENS
R68
R81
TR20
PEAK: H "ON"
IC5 1/2
IC6 1/2
PRE DRIVER
IC7 1/2
PEAK LEVEL METER DRIVER
TR21
C46
TR22
IC8 1/2
METER DRIVE AMP
TR23
POWER ON "ON"
J29
METER OUT
VU "H" ON
D17
(TUNING)
TEST MUTE
PB MUTE
SOURCE MUTE
J27
TUNING PB OUT
J28
IPLS OUT
IC2
TUNING PB DET
(R-CH ONLY)
ON ← OFF
DOLBY SW
TR28
VR6
P.B. EQ
P·B EQ AMP
TR36
70μ: H ON
VL1
BIAS FILTER
VR5
PB LEVEL
IC9
PB AMP
VR10
DOLBY DECODER
FL4
BIAS FILTER
IC10 HA12058
DB (DECODE)
L: DECODE
R159
C93
R31
R169
OFF ← ON
DOLBY SW
B ← C
DOLBY B/C
H: C TYPE
MID: B TYPE
L: OFF
TR6
TEST (TUNING) "ON"
PB/MONITOR LINE
REC LINE

GX-R88 TUNING BLOCK DIAGRAM

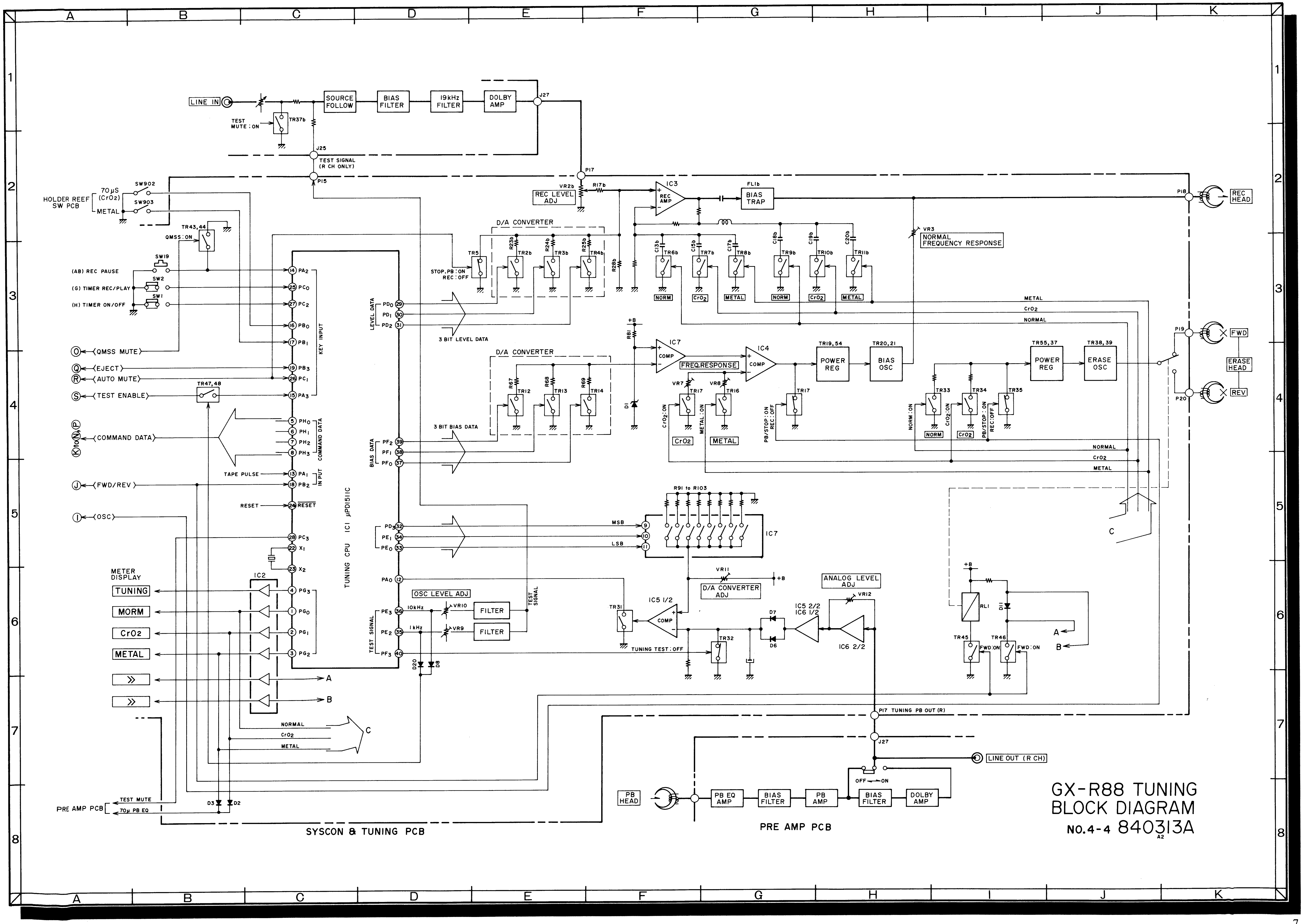
NO.4-2 840313A

A2

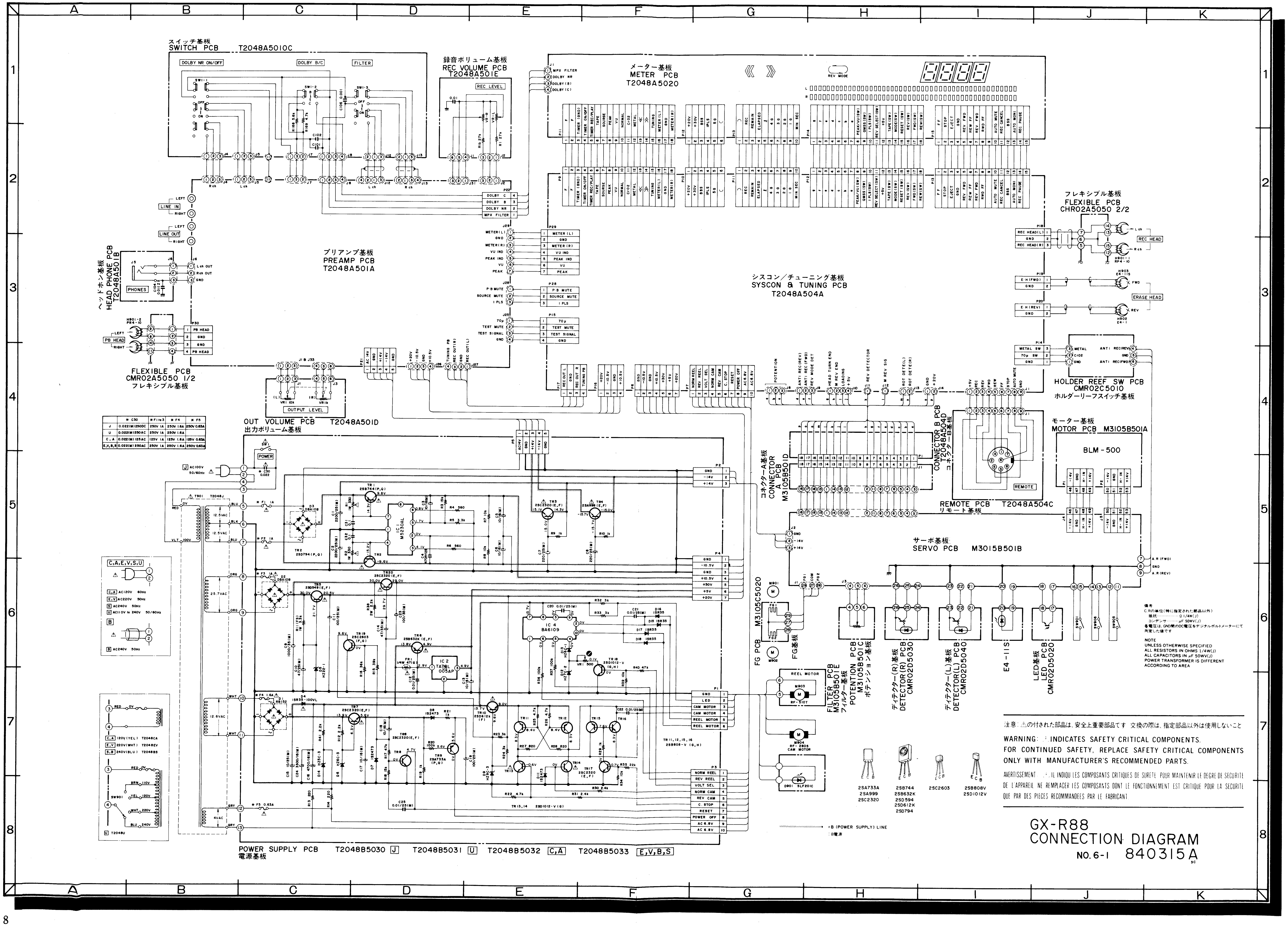

IC201 μPD1511C-134 TAPE COUNTER/REMAINING MICOM
IC202 SYSCON MICOM M5L8049-137P-6
IC203 OUTPUT EXPANDER M5L8243P
IC204 INPUT EXPANDER LC7800
IC205 INPUT EXPANDER LC7800
IC206 LB1290
IC207 LB1290
IC212 IC213
IC209
IC210
IC211 LA6458
IC214
P7
NORM REEL
REV REEL
VOLT SELE
NORM CAM
REV CAM
CAM STOP
COMMAND OR (FROM TUNING MICOM)
QMSS MUTE
DIRECTION
R.REEL PULSE
L.REEL PULSE
REV DET
METAL
EJECT
QMSS
RESET
COUNTER MODE
TAPE SIZE
PLAY
COUNTER DISABLE
EJECT
FIX
FAST
SEARCH
STOP
PLAY
IPLS LED
BSS LED
STROVE
IPLS
RESET
R.REEL PULSE
INT
EJECT POSITION DET
OUTPUT EXPANSION DATA
CAPSTAN MOTOR INVERT
PEAK
VU
REV REEL
NORM REEL
VOLT SELE
NORM CAM
CAM STOP
REV CAM
TR201
TR202
TR203
TR204
TR205
TR206
TR207
TR210
TR211
TR212
TR213
R201
R202
R203
R204
R205
R206
R208
R223
R225
R226
R234
R238
D203
D204
+10.5V
-10.5V
+5V
1/2
P29
VU
PEAK
P28
PB MUTE
SOURSE MUTE
IPLS
QMSS MUTE
EJECT
AUTO MUTE
TEST ENABLE
OSC
COMMAND OR
COMMAND D3
COMMAND D2
COMMAND D1
COMMAND D0
FWD REV
REC PAUSE
TEST ENABLE (MECHA STOP:"L")
To REV SELECTOR INDICATOR
MREV INV
REV DET
J12
J11
J8
POTENTION
POTENTION
POTENTION
J9
ANTI REC (R)
ANTI REC (L)
REV MODE DET
J10
HEAD TURN END
M.REV END
LOADING
VR201
QUICK REV SENS
TR214 to 216
LEADER DET
REV/FWD STATUS DET.
LEADER REV
HEAD TURN END
CAPSTAN MOTOR REVERSE END
COMMAND 3
LOADING(SW)
REMAIN
ELAPSED
4G
3G
2G
1G
MIN SEC
MIN
SEC
METER
P12
PEAK/VU (SW)
QMSS (SW)
IPLS (SW)
REVERSE SELECTOR
TAPE SIZE (SW)
COUNTER MODE (SW)
RESET (SW)
REV (SW)
FWD (SW)
REW (SW)
P13
FF (SW)
STOP (SW)
EJECT (SW)
REV/REW
FWD/FF
REV/FWD
REV/FF
AUTO MUTE
REC CANSEL
BSS
AUTO MONI
REC PAUSE
A B C D E F G H I J K
1 2 3 4 5 6 7 8

GX-R88 SYSCON BLOCK DIAGRAM

NO.4-3 831204B


A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6
7
8
LINE IN
TEST MUTE : ON
TR37b
SOURCE FOLLOW
BIAS FILTER
19kHz FILTER
DOLBY AMP
J27
J25
TEST SIGNAL (R CH ONLY)
P15
P17
VR2b
R17b
REC LEVEL ADJ
IC3
REC AMP
FL1b
BIAS TRAP
P18
REC HEAD
HOLDER REEF SW PCB
70μS (CrO2)
METAL
SW902
SW903
TR43, 44
QMSS : ON
SW19
(AB) REC PAUSE
SW2
(G) TIMER REC/PLAY
SW1
(H) TIMER ON/OFF
D/A CONVERTER
TR5
STOP, PB : ON
REC : OFF
R23b
TR2b
R24b
TR3b
R25b
TR4b
R28b
C13b
TR6b
C15b
TR7b
C17b
TR8b
C18b
TR9b
C19b
TR10b
C20b
TR11b
NORM
CrO2
METAL
VR3
NORMAL FREQUENCY RESPONSE
METAL
CrO2
NORMAL
PA2
PC0
PC2
PB0
PB1
PB3
PC1
PA3
KEY INPUT
O (QMSS MUTE)
Q (EJECT)
R (AUTO MUTE)
S (TEST ENABLE)
TR47, 48
K to N, P (COMMAND DATA)
PH0
PH1
PH2
PH3
COMMAND DATA
TAPE PULSE
PA1
PB2
IN PUT
J (FWD/REV)
RESET
I (OSC)
PC3
X1
X2
TUNING CPU IC1 μPD1511C
LEVEL DATA
PD0
PD1
PD2
3 BIT LEVEL DATA
+B
R81
IC7
COMP
FREQ.RESPONSE
IC4
COMP
TR19, 54
POWER REG
TR20, 21
BIAS OSC
TR55, 37
POWER REG
TR38, 39
ERASE OSC
P19
FWD
ERASE HEAD
REV
P20
D/A CONVERTER
R67
TR12
R68
TR13
R69
TR14
3 BIT BIAS DATA
D1
VR7
TR17
VR8
TR16
CrO2 : ON
METAL : ON
CrO2
METAL
PB/STOP : ON
REC : OFF
TR17
TR33
TR34
TR35
NORM : ON
CrO2 : ON
PB/STOP : ON
REC : OFF
NORM
CrO2
NORMAL
CrO2
METAL
BIAS DATA
PF2
PF1
PF0
R91 to R103
C
PD3
PE1
PE0
MSB
LSB
IC7
METER DISPLAY
IC2
TUNING
MORM
CrO2
METAL
»
»
PG3
PG0
PG1
PG2
PA0
VR11
+B
D/A CONVERTER ADJ
ANALOG LEVEL ADJ
VR12
TR31
IC5 1/2
COMP
D7
D6
IC5 2/2
IC6 1/2
IC6 2/2
TR32
TUNING TEST : OFF
OSC LEVEL ADJ
TEST SIGNAL
PE3
PE2
PF3
10kHz
VR10
FILTER
1kHz
VR9
FILTER
TEST SIGNAL
D20
D8
A
B
+B
RL1
D11
A
B
TR45
TR46
FWD : ON
FWD : ON
NORMAL
CrO2
METAL
C
P17 TUNING PB OUT (R)
J27
LINE OUT (R CH)
OFF — ON
PB HEAD
PB EQ AMP
BIAS FILTER
PB AMP
BIAS FILTER
DOLBY AMP
PRE AMP PCB
TEST MUTE
70μ PB EQ
D3
D2
SYSCON & TUNING PCB
PRE AMP PCB
A2

GX-R88 TUNING
BLOCK DIAGRAM
NO.4-4 840313A


スイッチ基板
SWITCH PCB T2048A5010C
DOLBY NR ON/OFF
DOLBY B/C
FILTER
録音ボリューム基板
REC VOLUME PCB
T2048A501E
REC LEVEL
メーター基板
METER PCB
T2048A5020
REV MODE
LINE IN
LINE OUT
ヘッドホン基板
HEAD PHONE PCB
T2048A501B
PHONES
PB HEAD
FLEXIBLE PCB
CMR02A5050 1/2
フレキシブル基板
プリアンプ基板
PREAMP PCB
T2048A501A
OUTPUT LEVEL
OUT VOLUME PCB T2048A501D
出力ボリューム基板
シスコン／チューニング基板
SYSCON & TUNING PCB
T2048A504A
フレキシブル基板
FLEXIBLE PCB
CHR02A5050 2/2
REC HEAD
ERASE HEAD
HOLDER REEF SW PCB
CMR02C5010
ホルダーリーフスイッチ基板
CONNECTOR B PCB
T2048A504D
コネクターB基板
コネクターA基板
CONNECTOR A PCB
M3105B501D
モーター基板
MOTOR PCB M3105B501A
BLM-500
REMOTE
REMOTE PCB T2048A504C
リモート基板
サーボ基板
SERVO PCB M3015B501B
FG PCB M3105C5020
FG基板
FILTER PCB
M3105B501E
フィルター基板
POTENTION PCB
M3105B501C
ポテンション基板
ディテクター(R)基板
DETECTOR(R) PCB
CMR02D5030
ディテクター(L)基板
DETECTOR(L) PCB
CMR02D5040
E4-115
LED基板
LED PCB
CMR02D5020
REEL MOTOR
CAM MOTOR
POWER
AC100V 50/60Hz
IC 1 M5230AL
IC 2 TA78L005AP
IC 4 BA6109
2SA733A
2SA999
2SC2320
2SB744
2SB632K
2SD594
2SD612K
2SD794
2SC2603
2SB808V
2SD1012V
B (POWER SUPPLY) LINE
POWER SUPPLY PCB T2048B5030 J T2048B5031 U T2048B5032 C,A T2048B5033 E,V,B,S
電源基板

備考
C.Rの単位（特に指定された部品以外）
抵抗……………Ω 1/4W(J)
コンデンサ………μF 50WV(J)
各電圧は、GND間のDC電圧をデジタルボルトメーターにて測定した値です

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/4W(J)
ALL CAPACITORS IN μF 50WV(J)
POWER TRANSFORMER IS DIFFERENT
ACCORDING TO AREA

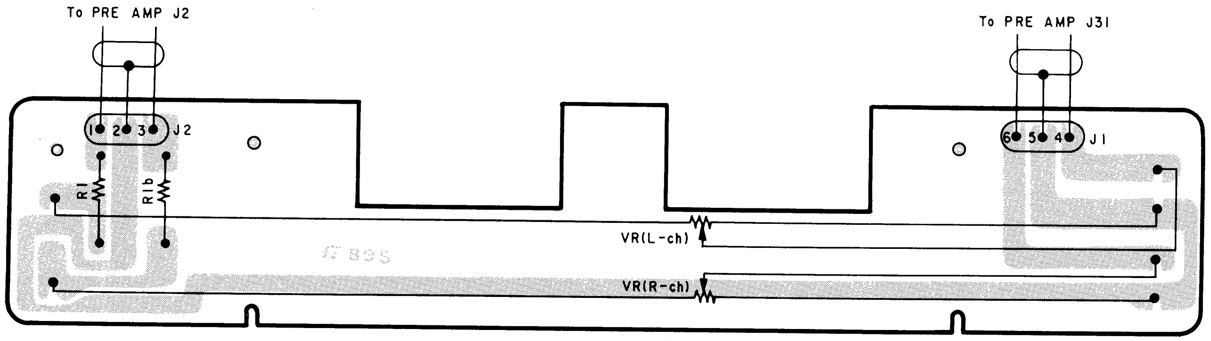
注意：⚠の付された部品は、安全上重要部品です 交換の際は、指定部品以外は使用しないこと

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS.
FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

AVERTISSEMENT ⚠ IL INDIQU LES COMPOSANTS CRITIQUES DE SURETE POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.

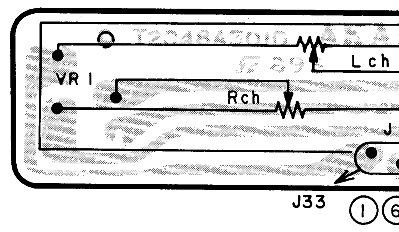
GX-R88
CONNECTION DIAGRAM

NO. 6-1 840315A
3C


To PRE AMP J2
J2
R1
R1b
VR(L-ch)
VR(R-ch)
To PRE AMP J31
J1

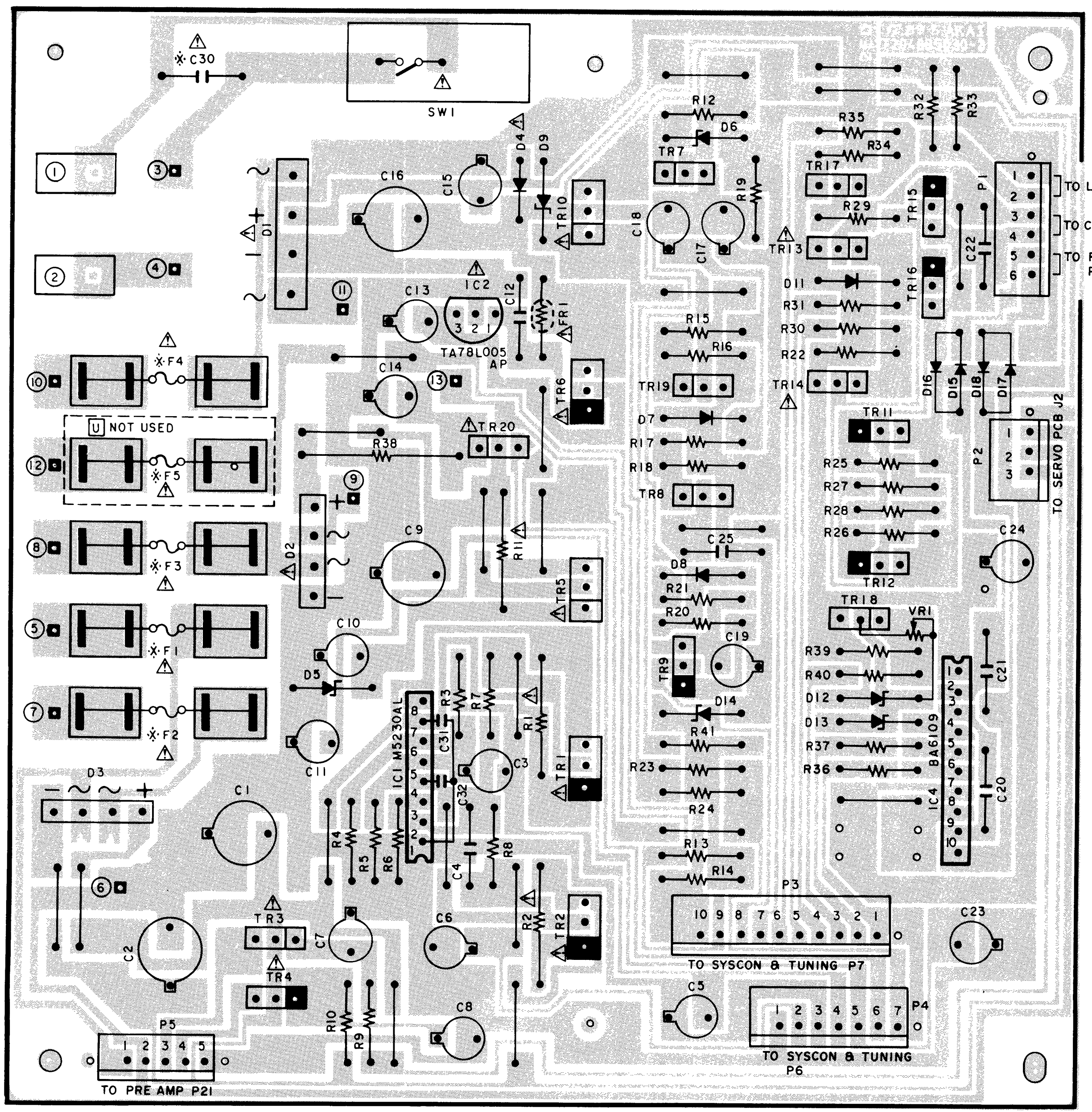
REC VOLUME PCB T2048A501E
録音ボリューム基板

出力ボリューム基板
OUT VOLUME PCB T2

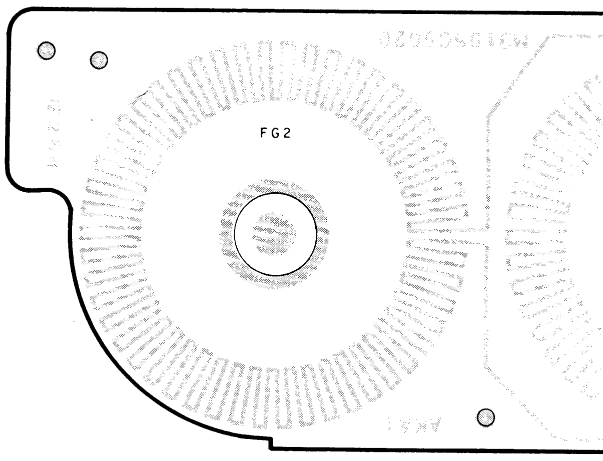

VR 1
Lch
Rch
J33

※	F1to3	F4	F5
U	250V 1A	250V 1.6A	
J	250V 1A	250V 1.6A	250V 0.63A
C,A	125V 1A	125V 1.6A	125V 0.63A
E,V,B,S	250 1A	250V 1.6A	250V 0.63A

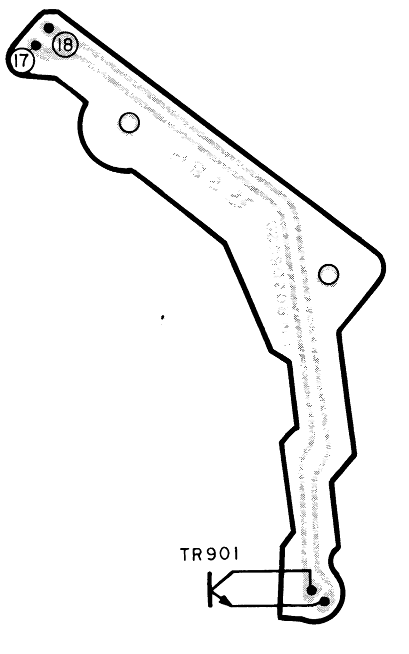
※	C30
U	0.022 (M) 250AC
J	0.022 (M) 250DC
C,A	0.022 (M) 125AC
E,V,B,S	0.022 (M) 250AC


※C30
SW1
D4
D9
D6
R12
TR7
R19
R35
R34
R32
R33
TR17
R29
TR15
P1
TO LED D901
TO CAM MOTOR
TO REEL MOTOR PCB
C16
C15
TR10
C18
C17
TR13
D1
D11
R31
R30
R22
TR16
C22
C13
IC2
C12
FR1
TA78L005 AP
C14
R15
R16
TR19
TR14
D16
D15
D18
D17
※F4
U NOT USED
※F5
TR6
TR20
R38
D7
R17
R18
TR8
TR11
R25
R27
R28
R26
P2
TO SERVO PCB J2
D2
C9
R11
C25
D8
R21
R20
TR5
TR12
C24
※F3
TR18
VR1
※F1
C10
D5
C19
TR9
R39
R40
D12
D13
R37
R36
D14
R41
R23
R24
BA6109
IC4
C21
C20
※F2
IC1 M5230AL
R3
R7
C31
C32
C3
R1
TR1
C11
D3
C1
R4
R5
R6
C4
R8
R13
R14
P3
TO SYSCON & TUNING P7
C23
TR3
C7
C6
R2
TR2
C2
TR4
C5
P4
TO SYSCON & TUNING P6
C8
R10
R9
P5
TO PRE AMP P21

電源基板
POWER SUPPLY PCB
T2048B5030 J
T2048B5031 U
T2048B5032 C A
T2048B5033 E V S B



FG PCB M3
FG基板



LED基板
LED PCB
CMR02D502

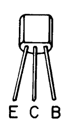
TR1---------2SB744(P,Q)
TR2----------2SD794(P,Q)
TR3---------2SC2320(E,F)
TR4---------2SA999(E,F)
TR5----------2SD549(E,F)
TR6----------2SB632K(E,F)
TR7,8,17,19,20--2SC2603(E,F)
TR9----------2SA733A(P,Q)
TR10---------2SD612K(F)
TR11,12,15,16--2SB808V(G,H)
TR13,14,18----2SD1012V(G)

■●●= PNP TRANSISTOR
B
●●●= NPN TRANSISTOR
B
—▶|— SILICON DIODE
—▷|— GERMANUM DIODE

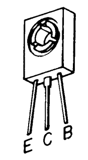
注意：⚠の付された部品は、安全上重要部品です 交換の際は、指定部品以外は使用しないこと

WARNING: ⚠INDICATES SAFETY CRITICAL COMPONENTS.
FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

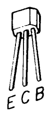
AVERTISSEMENT: ⚠ IL INDIQU LES COMPOSANTS CRITIQUES DE SURETE. POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.



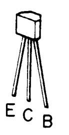
2SA733A
2SA999
2SC2320



2SB744
2SB632K
2SD594
2SD612K
2SD794

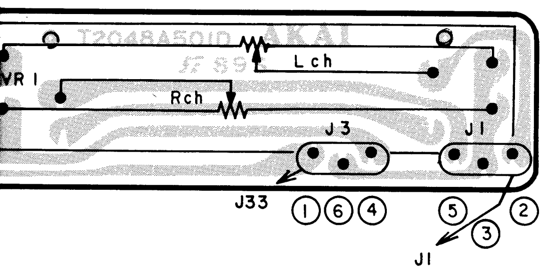


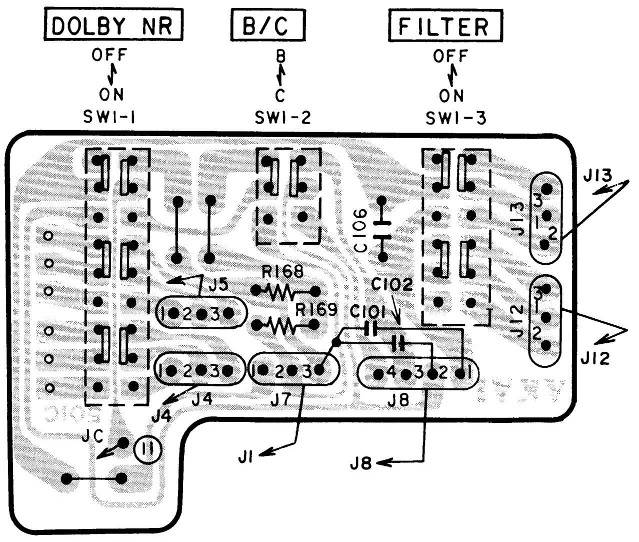
2SC2603



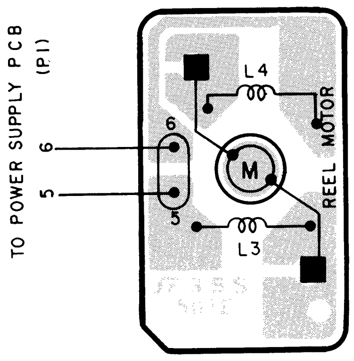
2SB808V
2SD1012V

カボリューム基板
T VOLUME PCB T2048A501D

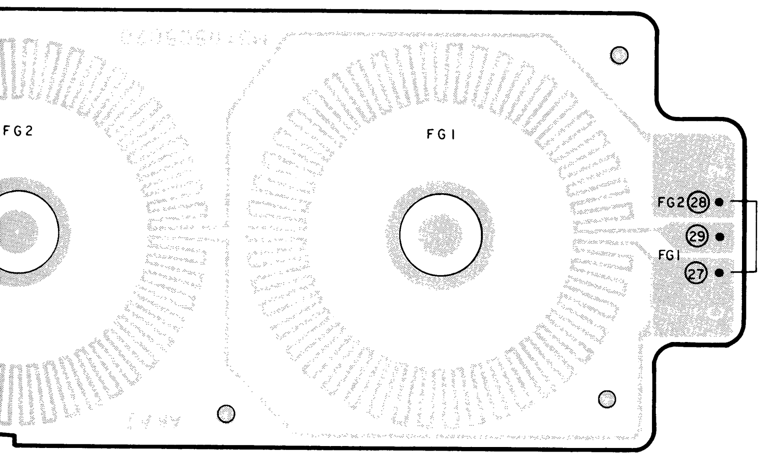

T2048A501D
VR1
Lch
Rch
J3
J1
J33
①⑥④
⑤ ③ ②
J1


DOLBY NR
OFF
ON
SW1-1
B/C
B
C
SW1-2
FILTER
OFF
ON
SW1-3
J13
C106
J5
R168
C102
R169
C101
J12
J4
J7
J8
JC
⑪
J1
J8

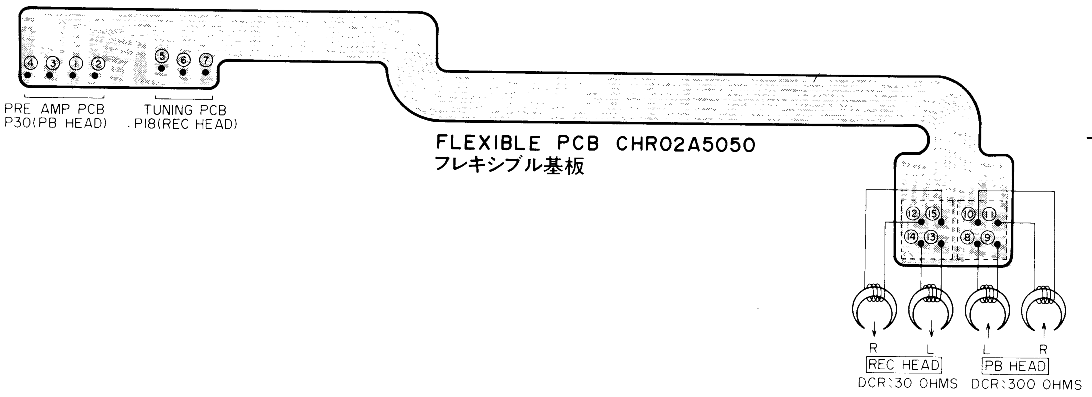
SWITCH PCB T2048A501C
スイッチ基板


TO POWER SUPPLY PCB (P1)
6
5
L4
M
REEL MOTOR
L3

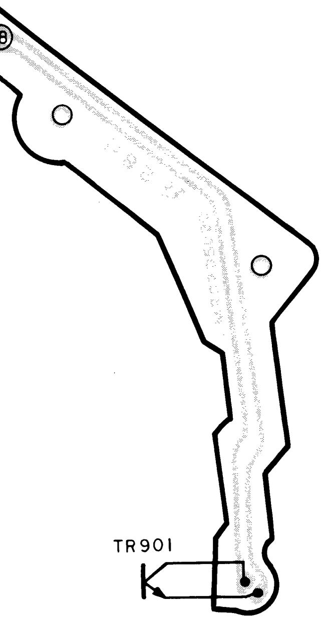
FILTER PCB
M3105B501E
フィルター基板


FG2
FG1
FG2 ㉘
㉙
FG1 ㉗
TO SERVO PCB J1

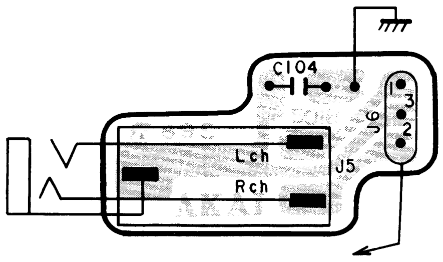
FG PCB M3105C5020
FG基板


④③①②
⑤⑥⑦
PRE AMP PCB P30(PB HEAD)
TUNING PCB P18(REC HEAD)
⑫⑮ ⑩⑪
⑭⑬ ⑧⑨
R L L R
REC HEAD DCR:30 OHMS
PB HEAD DCR:300 OHMS

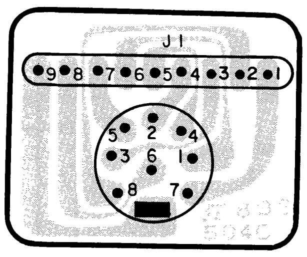
FLEXIBLE PCB CHR02A5050
フレキシブル基板



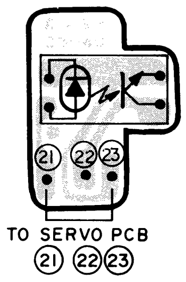
LED基板
LED PCB
CMR02D5020


C104
Lch
Rch
J5
J6
1
3
2

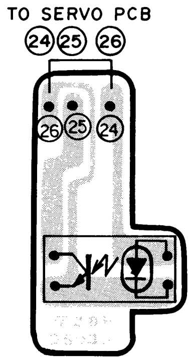
HEAD PHONE PCB T2048A501B
ヘッドホン基板


J1
9 8 7 6 5 4 3 2 1
5 2 4
3 6 1
8 7

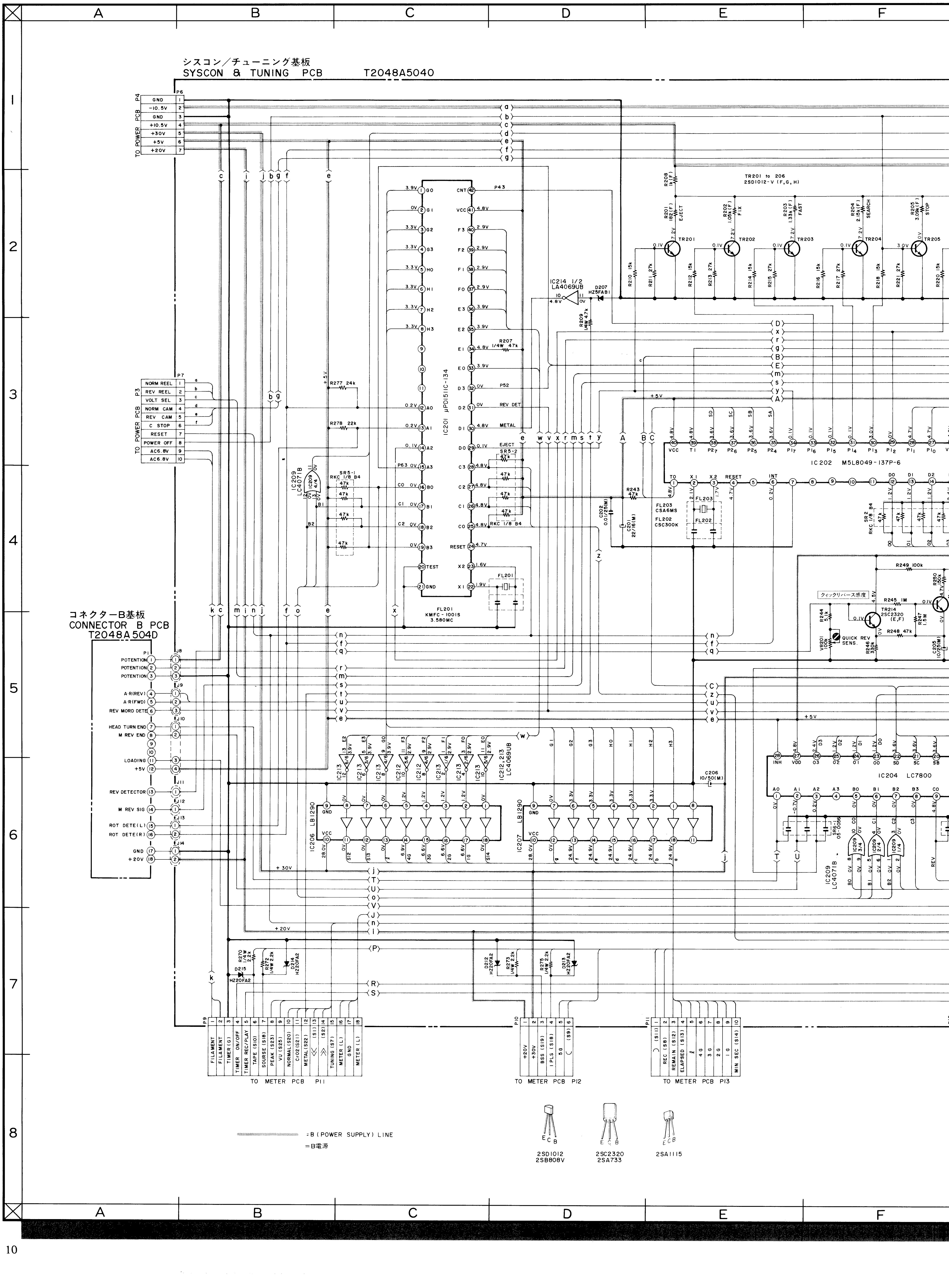
REMOTE CONTROL PCB
T2048B504C
リモートコントロール基板

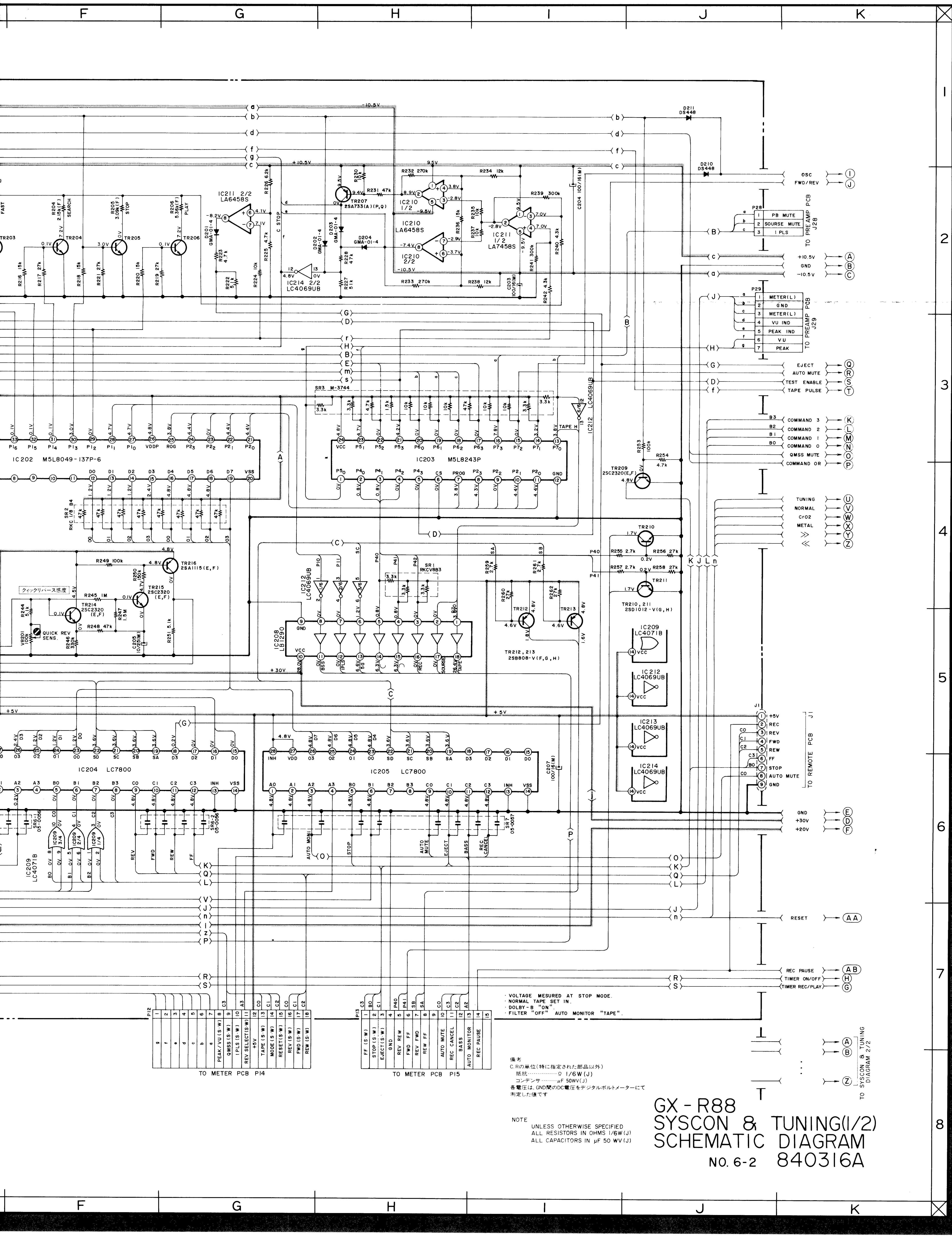

㉑ ㉒ ㉓
TO SERVO PCB
㉑ ㉒ ㉓

ディテクター(L)基板
DETECTOR(L) PCB
CMR02D5040


TO SERVO PCB
㉔ ㉕ ㉖
㉖ ㉕ ㉔

ディテクター(R)基板
DETECTOR(R) PCB
CMR02D5030


A
B
C
D
E
F
1
2
3
4
5
6
7
8
シスコン／チューニング基板
SYSCON & TUNING PCB T2048A5040
TO POWER PCB P4
GND
-10.5V
GND
+10.5V
+30V
+5V
+20V
P6
TO POWER PCB P3
P7
NORM REEL
REV REEL
VOLT SEL
NORM CAM
REV CAM
C STOP
RESET
POWER OFF
AC6.8V
AC6.8V
IC201 μPD1511C-134
CNT
VCC
TEST
GND
RESET
FL201
KMFC-1001S
3.580MC
IC214 1/2
LA4069UB
D207
HZ5FAB1
R209
R207 1/4W 47k
R277 24k
R278 22k
IC209 LC4071B
SR5-1 RKC 1/8 B4
SR5-2 RKC 1/8 B4
P43
P52
REV DET
METAL
EJECT
TR201 to 206
2SD1012-V (F,G,H)
R208 1k(F)
R201 182(F) EJECT
R202 1.05k(F) FIX
R203 1.33k(F) FAST
R204 2.15k(F) SEARCH
R205 3.09k(F) STOP
TR201
TR202
TR203
TR204
TR205
IC202 M5L8049-137P-6
R243 47k
C202 0.01/25(M)
C201 22/16(M)
FL203 CSA6MS
FL202 CSC300K
SR2 RKC 1/8 B4
R249 100k
R250 150k
クイックリバース感度
R245 1M
TR214 2SC2320 (E,F)
R244 5.1k
R247 1.5M
R248 47k
VR201 100k QUICK REV SENS.
R246 33k
C205 10/25(M)
IC204 LC7800
C206 10/50(M)
IC212, 213 LC4069UB
IC213
IC212
LB1290
IC206
IC207
IC209 LC4071B
SR6-1
コネクターB基板
CONNECTOR B PCB
T2048A504D
P1
POTENTION
A R(REV)
A R(FWD)
REV MORD DETE
HEAD TURN END
M REV END
LOADING
+5V
REV DETECTOR
M REV SIG
ROT DETE(L)
ROT DETE(R)
GND
+20V
J8
J9
J10
J11
J12
J13
J14
+30V
+20V
R270 1/4W 2.2k
D215 HZ20FA2
R272 1/4W 2.2k
D214 HZ20FA2
D212 HZ20FA2
R273 1/4W 2.2k
R275 1/4W 2.2k
D213 HZ20FA2
P9
FILAMENT
FILAMENT
TIMER (G)
TIMER ON/OFF
TIMER REC/PLAY
TAPE (S10)
SOURE (S18)
PEAK (S23)
VU (S25)
NORMAL (S20)
CrO2 (S21)
METAL (S22)
(S1)
(S2)
TUNING (S7)
METER (L)
GND
METER (L)
TO METER PCB P11
P10
+20V
+30V
BSS (S19)
1 PLS (S19)
5G
(S9)
TO METER PCB P12
P11
(S11)
REC (S8)
REMAIN (S12)
ELAPSED (S13)
4G
3G
2G
1G
MIN SEC (S14)
TO METER PCB P13
2SD1012
2SB808V
2SC2320
2SA733
2SA1115
=B (POWER SUPPLY) LINE
=B電源


F
G
H
I
J
K
1
2
3
4
5
6
7
8
IC211 2/2 LA6458S
IC210 1/2
IC210 LA6458S
IC210 2/2
IC211 1/2 LA7458S
IC214 2/2 LC4069UB
TR207 2SA733(A)(P,Q)
D201 GMA-01-4
D202 GMA-01-4
D203 GMA-01-4
D204 GMA-01-4
D210 DS448
D211 DS448
C204 100/16(M)
C203 100/16(M)
OSC
FWD/REV
P28
PB MUTE
SOURSE MUTE
I PLS
TO PREAMP PCB J28
+10.5V
GND
-10.5V
P29
METER(L)
GND
METER(L)
VU IND
PEAK IND
VU
PEAK
TO PREAMP PCB J29
EJECT
AUTO MUTE
TEST ENABLE
TAPE PULSE
COMMAND 3
COMMAND 2
COMMAND 1
COMMAND 0
QMSS MUTE
COMMAND OR
TUNING
NORMAL
CrO2
METAL
≫
≪
R204 2.2k(F) SEARCH
R205 3.09k(F) STOP
R206 5.36k(F) PLAY
TR203
TR204
TR205
TR206
IC202 M5L8049-137P-6
IC203 M5L8243P
SR3 M-3744
SR2 RKC 1/8 B4
IC212 LC4069UB
TR209 2SC2320(E,F)
TR210
TR211
TR210, 211 2SD1012-V(G,H)
TR212
TR213
TR212, 213 2SB808-V(F,G,H)
TR214 2SC2320 (E,F)
TR215 2SC2320 (E,F)
TR216 2SA1115(E,F)
クイックリバース感度
VR201 10k QUICK REV SENS.
C205 10/25(M)
IC208 LB1290
SR1 RKCV883
IC209 LC4071B
IC212 LC4069UB
IC213 LC4069UB
IC214 LC4069UB
J1
+5V
REC
REV
FWD
REW
FF
STOP
AUTO MUTE
GND
TO REMOTE PCB
IC204 LC7800
IC205 LC7800
C207 100/16(M)
SR6-2 05-0056
SR7 05-0057
IC209 3/4
IC209 2/4
IC209 1/4
IC209 LC4071B
GND
+30V
+20V
RESET
REC PAUSE
TIMER ON/OFF
TIMER REC/PLAY
P12
PEAK/VU(S.W)
QMSS(S.W)
REV SELECT(S.W)
+5V
TAPE(S.W)
MODE(S.W)
RESET(S.W)
REV(S.W)
FWD(S.W)
REW(S.W)
TO METER PCB P14
P13
FF(S.W)
STOP(S.W)
EJECT(S.W)
GND
REV REW
REV FF
REV FWD
REW FF
AUTO MUTE
REC CANCEL
BASS
AUTO MONITOR
REC PAUSE
TO METER PCB P15
TO SYSCON & TUNING DIAGRAM 2/2

· VOLTAGE MESURED AT STOP MODE.
· NORMAL TAPE SET IN.
· DOLBY-B "ON".
· FILTER "OFF" AUTO MONITOR "TAPE".

備考
C.Rの単位(特に指定された部品以外)
抵抗··············Ω 1/6W(J)
コンデンサ·········μF 50WV(J)
各電圧は、GND間のDC電圧をデジタルボルトメーターにて
測定した値です

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(J)
ALL CAPACITORS IN μF 50 WV(J)

GX-R88
SYSCON & TUNING(1/2)
SCHEMATIC DIAGRAM

NO. 6-2 840316A

J8, 9, 10, 11
12, 13, 14 } → TO CONNECTOR B PCB. J1

LOCATION OF COMPONENTS

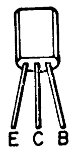
IC'S

IC1	4E	IC201	4B
IC2	2D	IC202	2B
IC3	2G	IC203	5B
IC4	6E	IC204	2B
IC5	2E	IC205	1B
IC6	1E	IC206	4A
IC7	3F	IC207	3A
IC8	1D	IC208	5A
IC9	1E	IC209	3C
		IC210	2C
		IC211	2C
		IC212	5B
		IC213	5B
		IC214	4C

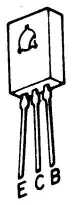
TR'S

TR1	1E	TR37	5F
TR2, 3	1G	TR38, 39	6F
TR2b	1F	TR43	1D
TR3b, 4b	1G	TR44	1E
TR5, 5b	1F	TR45	5F
TR6 to 8	3G	TR46	2D
TR6b to 8b	3G	TR47	4F
TR9 to 11	4G	TR48	5F
TR9b to 11b	4G	TR49	1F
TR12 to 15	6E	TR54	6F
TR16	5F	TR55	5F
TR17	6F	TR201 to 203	2C
		TR204 to 206	1C
TR19	6E	TR207	2C
TR20	6F	TR209	3C
TR21	6G	TR210 to 213	1C
TR29, 30	4D	TR214 to 216	5C
TR31, 32	2E		
TR33 to 35	5E		

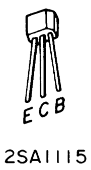
TR 1, 44, 216	2SA1115(EF)
TR2 to 4, 6 to 11 2b to 4b, 6b to 11b	2SC3383(S,T)
TR12 to 17, 29 to 35, 43 46, 209, 214, 215	2SC2320(EF)
TR19, 37	2SC1815 (BL,GR)
TR20, 21, 38, 39	2SC2274K(E)
TR5, 5b, 45, 201 to 206 210, 211	2SD1012-V(G,H)
TR47 to 49	2SC3399
TR54	2SB764(EF)
TR55	2SB632K(EF)
TR207	2SA733A(P,Q)
TR212, 213	2SB808-V(F,G,H)



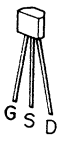
2SC3383
2SC2320
2SC1815
2SC2274
2SB764
2SA733



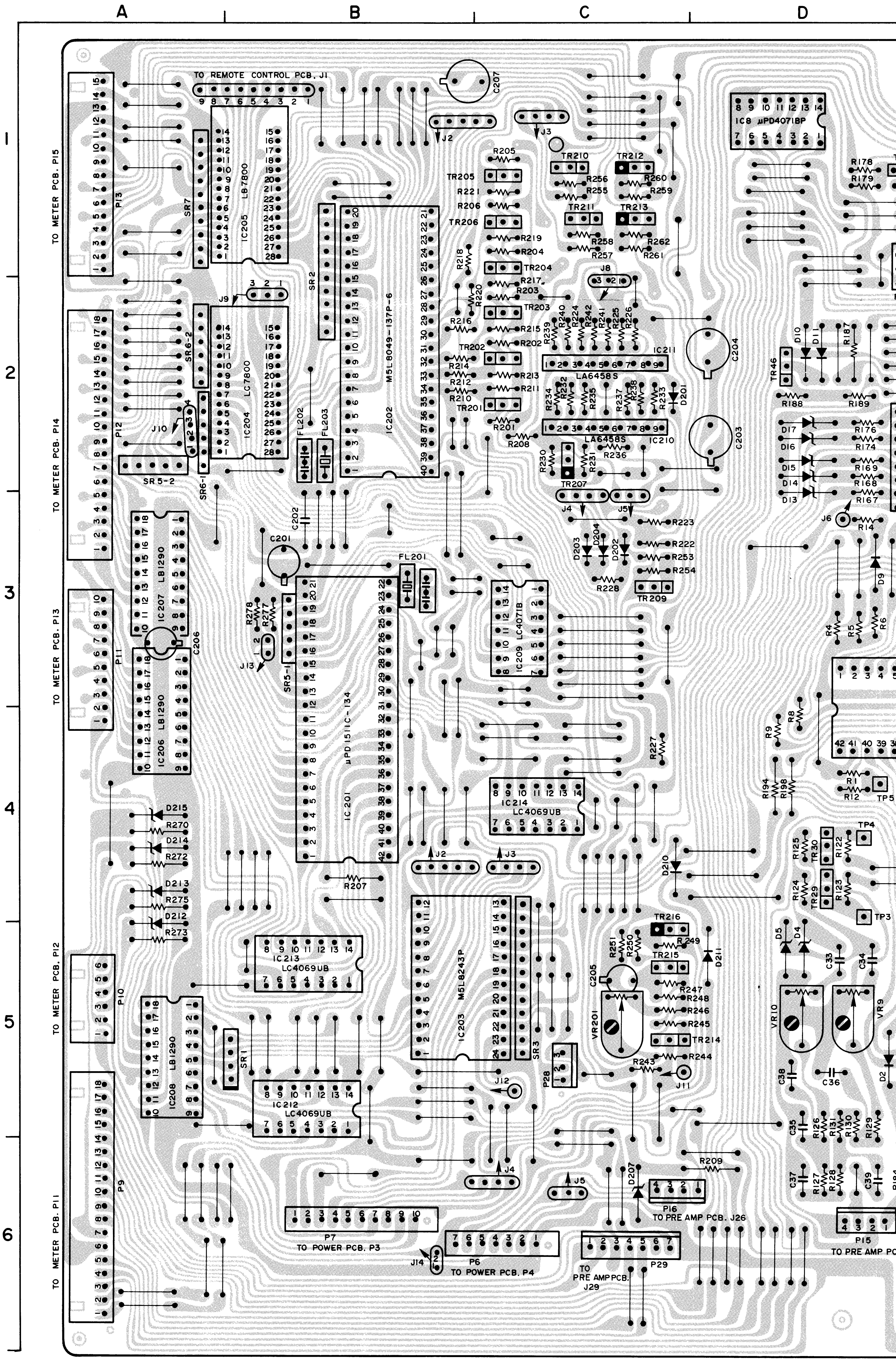
2SB632



2SA1115
2SC3399



2SD1012
2SB808


A
B
C
D
1
2
3
4
5
6
TO METER PCB. P15
TO METER PCB. P14
TO METER PCB. P13
TO METER PCB. P12
TO METER PCB. P11
TO REMOTE CONTROL PCB. J1
IC205 LB7800
IC204 LC7800
IC202 M5L8049-137P-6
IC201 μPD1511C-134
IC207 LB1290
IC206 LB1290
IC208 LB1290
IC203 M5L8243P
IC209 LC4071B
IC214 LC4069UB
IC213 LC4069UB
IC212 LC4069UB
IC211 LA6458S
IC210 LA6458S
IC8 μPD4071BP
P7 TO POWER PCB. P3
P6 TO POWER PCB. P4
TO PRE AMP PCB. J29
P29
P16 TO PRE AMP PCB. J26
P15 TO PRE AMP PCB.

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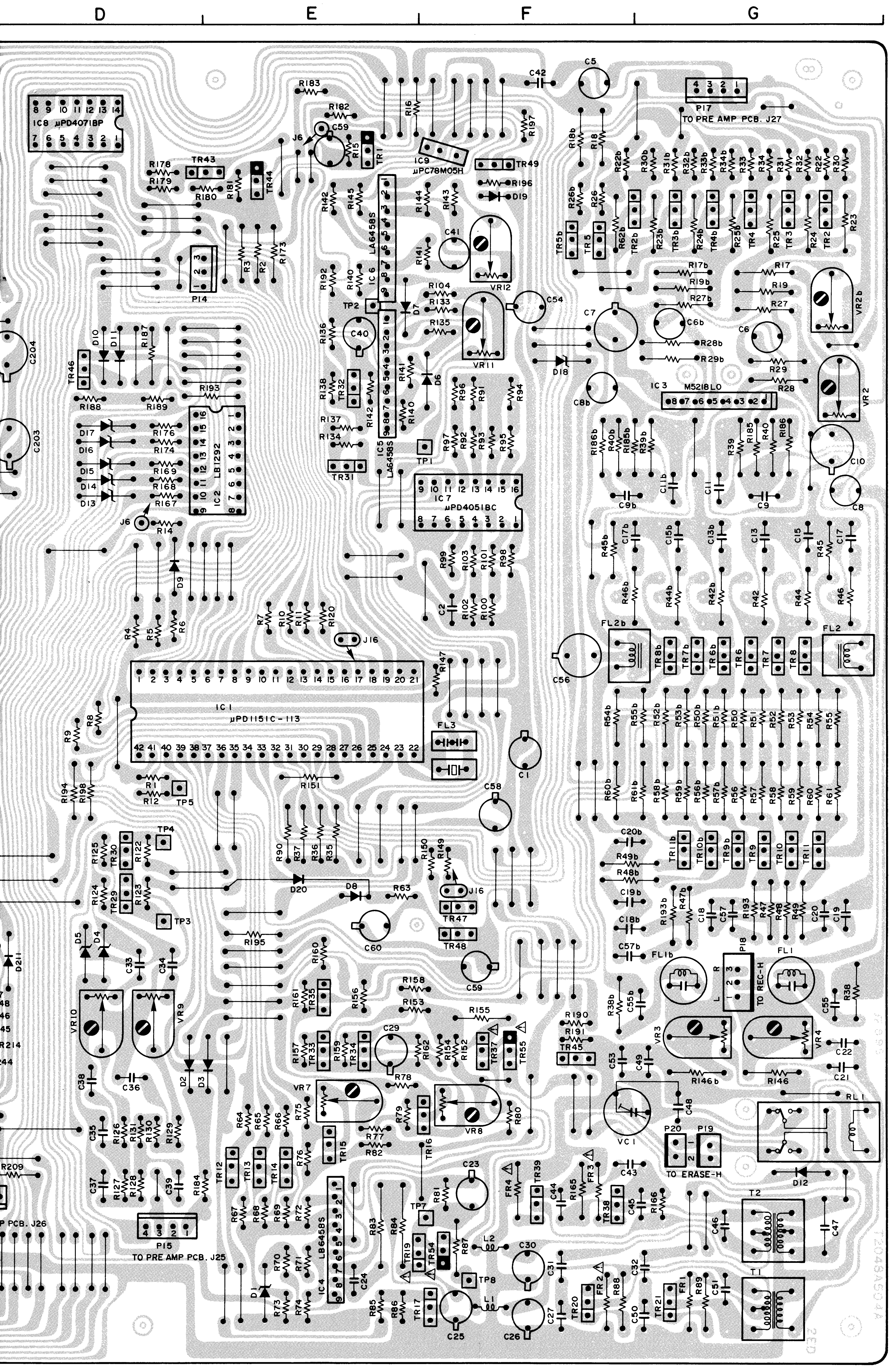
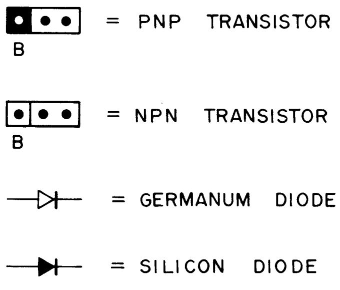
RNING: ⚠INDICATES SAFETY CRITICAL COMPONENTS.
R CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS
LY WITH MANUFACTURER'S RECOMMENDED PARTS.

TISSEMENT: ⚠ IL INDIQU LES COMPOSANTS CRITIQUES DE SURETE. POUR MAINTENIR LE DEGRE DE SECURITE
'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE
PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.


D
E
F
G
IC8 µPD4071BP
IC9 µPC78M05H
IC6 LA6458S
IC5 LA6458S
IC7 µPD4051BC
IC3 M5218LO
IC2 LB1292
IC1 µPD1151C-113
IC4 LB6458S
P17 TO PRE AMP PCB. J27
P14
P15 TO PRE AMP PCB. J25
P PCB. J26
P18 TO REC-H
P20 P19 TO ERASE-H
FL1
FL1b
FL2
FL2b
FL3
RL1
T1
T2
VC1
VR2
VR2b
VR3
VR4
VR7
VR8
VR9
VR10
VR11
VR12
T2048A504A

VR2--------REC LEVEL Lch
VR2b------REC LEVEL Rch
VR3--------FREQ RESPONCE(NORMAL) Lch
VR4-------FREQ RESPONCE(NORMAL) Rch
VR7-------FREQ RESPONCE(CrO2)
VR8-------FREQ RESPONCE(METAL)
VR9--------TEST SIGNAL (1KHz LEVEL)
VR10------TEST SIGNAL (10KHz LEVEL)
VR11------A/D CONVERTOR
VR12------ANALOG LEVEL
VR201-----QUICK REV SENS
T1 -------BIAS FREQ
T2 --------ERASE FREQ (REV)
VC1-------ERASE FREQ (FWD)


B
= PNP TRANSISTOR
B
= NPN TRANSISTOR
= GERMANUM DIODE
= SILICON DIODE

SYSTEM CONTROL & TUNING PCB T2048A504A(2ED)
システムコントロール／チューニング基板

J8, 9, 10, 11
12, 13, 14 } → TO CONNECTOR B PCB, J1

LOCATION OF COMPONENTS

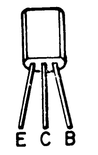
IC'S

IC1	4E	IC201	4B
IC2	2D	IC202	2B
IC3	2G	IC203	5B
IC4	6E	IC204	2B
IC5	2E	IC205	1B
IC6	1E	IC206	4A
IC7	3F	IC207	3A
IC8	1D	IC208	5A
IC9	1E	IC209	3C
		IC210	2C
		IC211	2C
		IC212	5B
		IC213	5B
		IC214	4C

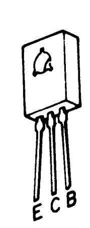
TR'S

TR1	1E	TR37	5F
TR2, 3	1G	TR38, 39	6F
TR2b	1F	TR43	1D
TR3b, 4b	1G	TR44	1E
TR5, 5b	1F	TR45	5F
TR6 to 8	3G	TR46	2D
TR6b to 8b	3G	TR47	4F
TR9 to 11	4G	TR48	5F
TR9b to 11b	4G	TR49	1F
TR12 to 15	6E	TR54	6F
TR16	5F	TR55	5F
TR17	6F	TR201 to 203	2C
		TR204 to 206	1C
TR19	6E	TR207	2C
TR20	6F	TR209	3C
TR21	6G	TR210 to 213	1C
TR29, 30	4D	TR214 to 216	5C
TR31, 32	2E		
TR33 to 35	5E		

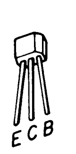
TR1, 44, 216	2SA1115(EF)
TR2 to 4, 6 to 11 2b to 4b, 6b to 11b	2SC3383(S,T)
TR12 to 17, 29 to 35, 43 46, 209, 214, 215	2SC2320(EF)
TR19, 37	2SC1815(BL,GR)
TR20, 21, 38, 39	2SC2274K(E)
TR5, 5b, 45, 201 to 206 210, 211	2SD1012-V(G,H)
TR47 to 49	2SC3399
TR54	2SB764(EF)
TR55	2SB632K(EF)
TR207	2SA733A(P,Q)
TR212, 213	2SB808-V(F,G,H)



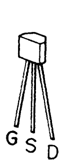
2SC3383
2SC2320
2SC1815
2SC2274
2SB764
2SA733



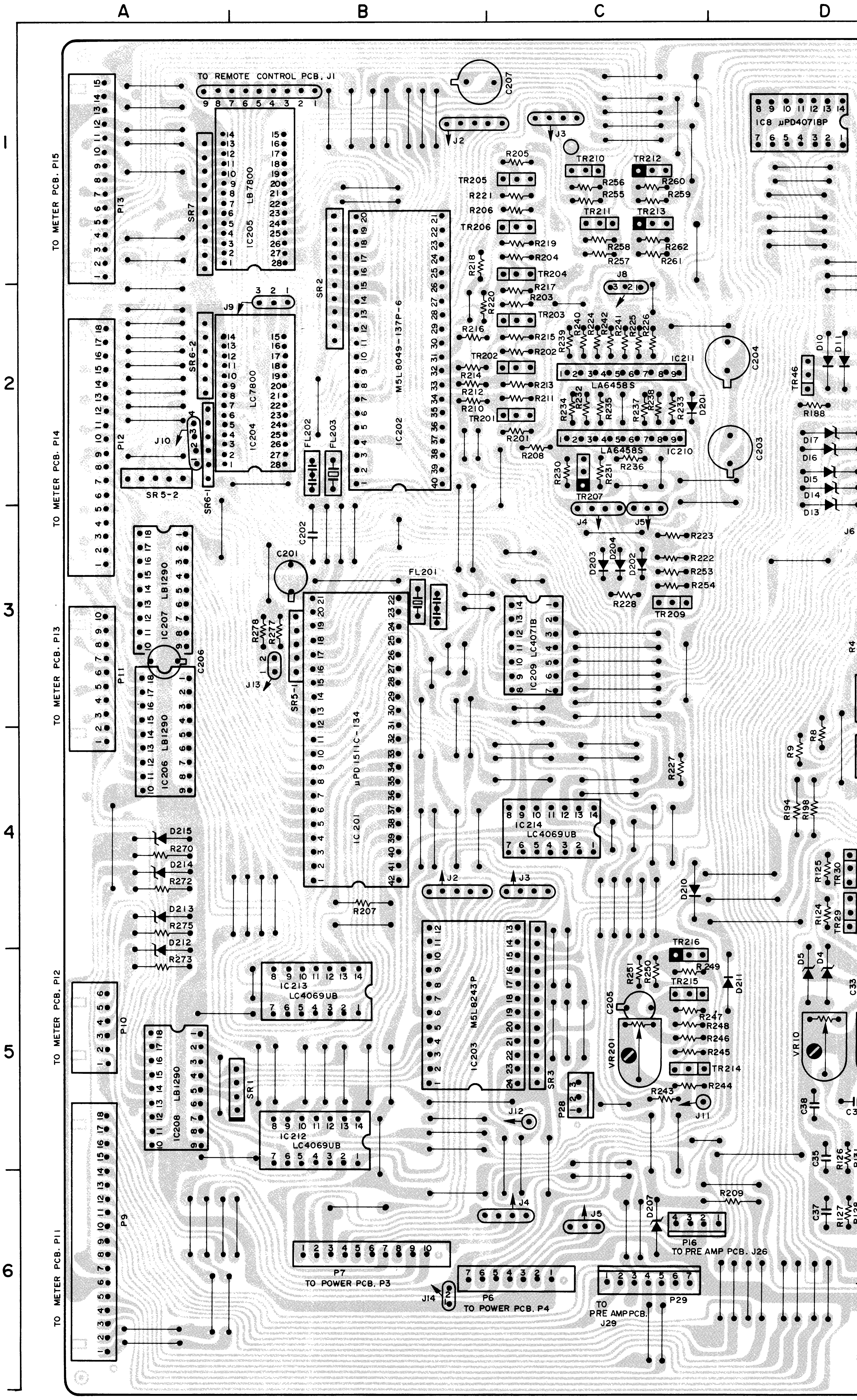
2SB632



2SA1115
2SC3399



2SD1012
2SB808


A
B
C
D
1
2
3
4
5
6
TO REMOTE CONTROL PCB, J1
TO METER PCB, P15
TO METER PCB, P14
TO METER PCB, P13
TO METER PCB, P12
TO METER PCB, P11
P13
P12
P11
P10
P9
SR7
SR6-2
SR6-1
SR5-2
SR5-1
SR2
SR1
SR3
IC205 LB7800
IC204 LC7800
IC202 M5L8049-137P-6
IC201 μPD1511C-134
IC203 M5L8243P
IC207 LB1290
IC206 LB1290
IC208 LB1290
IC209 LC4071B
IC210 LA6458S
IC211 LA6458S
IC214 LC4069UB
IC213 LC4069UB
IC212 LC4069UB
IC8 μPD4071BP
C201
C202
C203
C204
C205
C206
C207
FL201
FL202
FL203
VR201
VR10
J2
J3
J4
J5
J8
J9
J10
J11
J12
J13
J14
P7 TO POWER PCB, P3
P6 TO POWER PCB, P4
TO PRE AMP PCB, J29
P29
P16 TO PRE AMP PCB, J26
P28
TR201
TR202
TR203
TR204
TR205
TR206
TR207
TR209
TR210
TR211
TR212
TR213
TR214
TR215
TR216
TR46
TR29
TR30
D201
D202
D203
D204
D207
D210
D211
D212
D213
D214
D215
D4
D5
D10
D11
D13
D14
D15
D16
D17
R188
R207
R208
R209
R227
R228
R270
R272
R273
R275
R277
R278
R243
R244
R245
R246
R247
R248
R249
R250
R251
R253
R254
R222
R223

注意：⚠の付された部品は、安全上重要部品です 交換の際は、指定部品以外は使用しないこと

WARNING: ⚠INDICATES SAFETY CRITICAL COMPONENTS.
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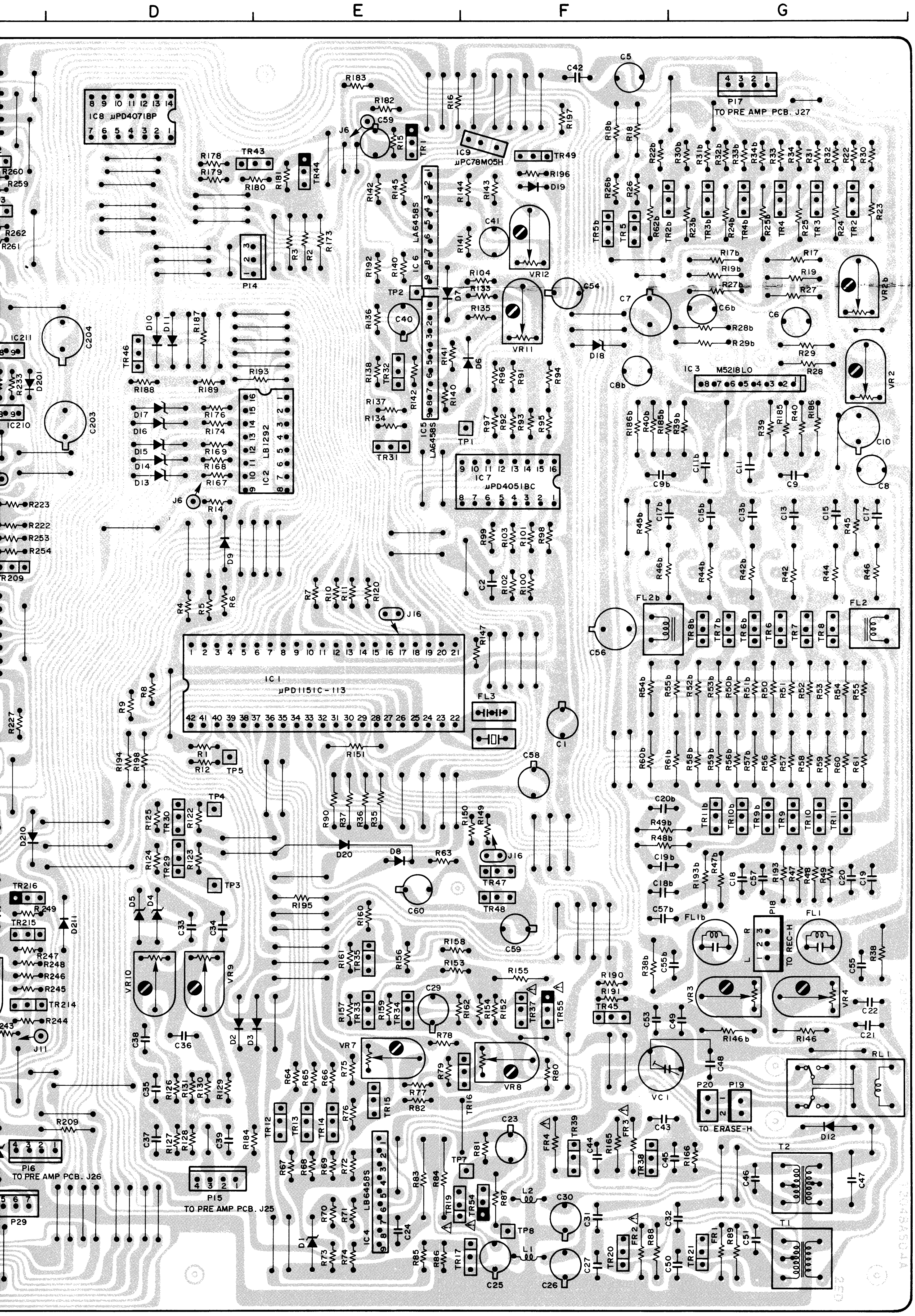
AVERTISSEMENT: ⚠ IL INDIQU LES COMPOSANTS CRITIQUES DE SURETE. POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.


D
E
F
G
IC8 µPD4071BP
IC9 µPC78M05H
IC6 LA6458S
IC5 LA6458S
IC7 µPD4051BC
IC3 M5218L0
IC2 LB1292
IC1 µPD1151C-113
IC4 LB6458S
IC211
IC210
P17 TO PRE AMP PCB. J27
P14
P16 TO PRE AMP PCB. J26
P15 TO PRE AMP PCB. J25
P18 TO REC-H
P20 P19 TO ERASE-H
P29
RL1
T1
T2
VC1
VR2
VR2b
VR3
VR4
VR7
VR8
VR9
VR10
VR11
VR12
FL1
FL1b
FL2
FL2b
FL3
J6
J11
J16
TP1
TP2
TP3
TP4
TP5
TP7
TP8

VR2--------REC LEVEL Lch
VR2b-------REC LEVEL Rch
VR3--------FREQ RESPONCE (NORMAL) Lch
VR4--------FREQ RESPONCE (NORMAL) Rch
VR7--------FREQ RESPONCE (cro2)
VR8--------FREQ RESPONCE (METAL)
VR9--------TEST SIGNAL (1KHz LEVEL)
VR10-------TEST SIGNAL (10KHz LEVEL)
VR11-------A/D CONVERTOR
VR12-------ANALOG LEVEL
VR201------QUICK REV SENS
T1---------BIAS FREQ
T2---------ERASE FREQ (REV)
VC1--------ERASE FREQ (FWD)

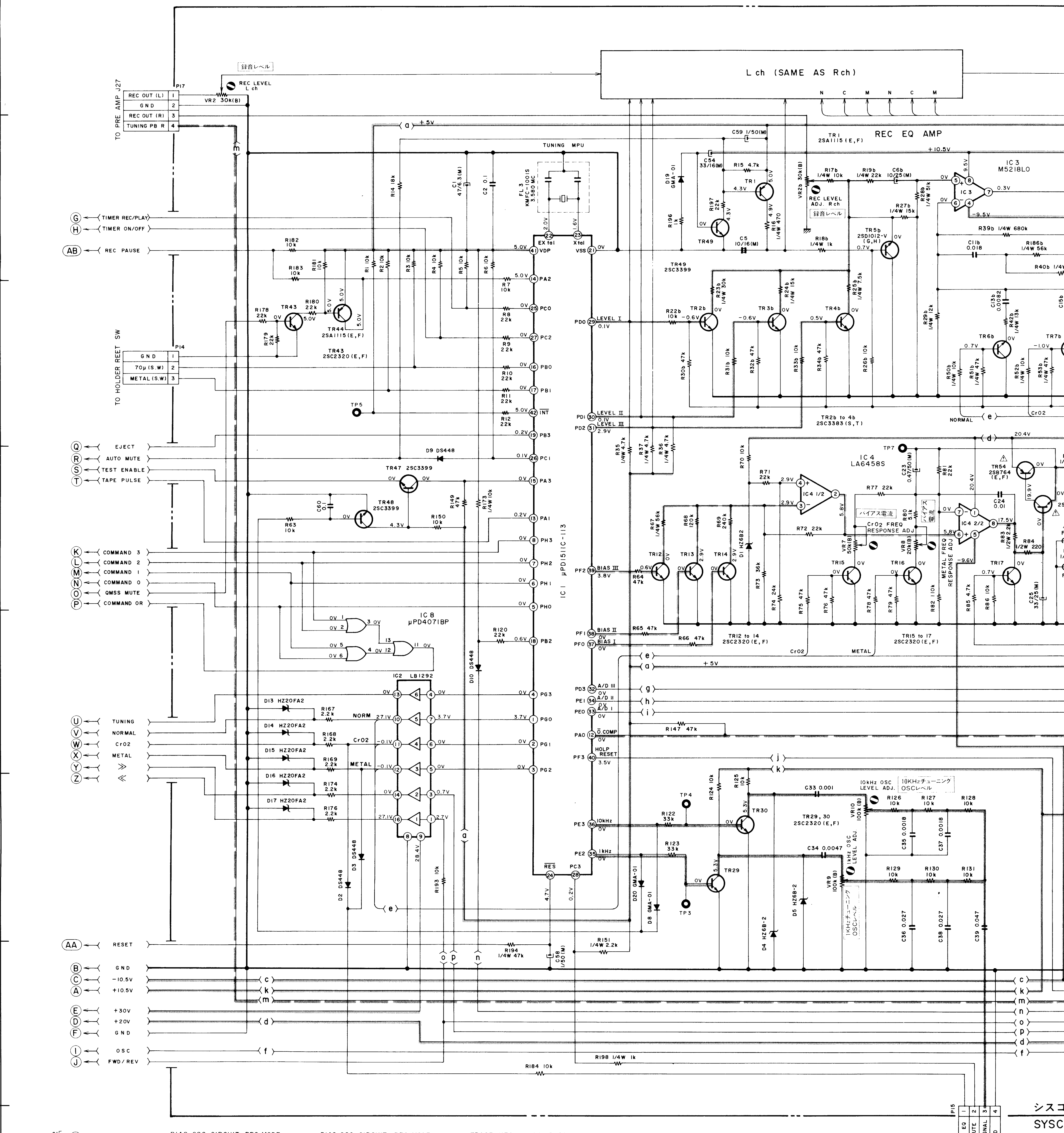
▣●● = PNP TRANSISTOR
B

●●● = NPN TRANSISTOR
B

—▷|— = GERMANUM DIODE

—▶|— = SILICON DIODE

SYSTEM CONTROL & TUNING PCB T2048A504A(2ED)
システムコントロール／チューニング基板


Lch (SAME AS Rch)
REC EQ AMP
TUNING MPU
IC1 μPD1511C-113
IC8 μPD4071BP
IC2 LB1292
IC3 M5218L0
IC4 LA6458S
FL3 KMFC-1001S 3.580MC
TO PRE AMP J27
REC OUT (L)
GND
REC OUT (R)
TUNING PB R
REC LEVEL Lch
録音レベル
REC LEVEL ADJ. Rch
TO HOLDER REET SW
70μ (S.W)
METAL (S.W)
TIMER REC/PLAY
TIMER ON/OFF
REC PAUSE
EJECT
AUTO MUTE
TEST ENABLE
TAPE PULSE
COMMAND 3
COMMAND 2
COMMAND 1
COMMAND 0
QMSS MUTE
COMMAND OR
TUNING
NORMAL
CrO2
METAL
≫
≪
RESET
GND
-10.5V
+10.5V
+30V
+20V
OSC
FWD/REV
TP3
TP4
TP5
TP7
ハイアス電流
CrO2 FREQ RESPONSE ADJ
METAL FREQ RESPONSE ADJ
10kHz OSC LEVEL ADJ.
10KHzチューニングOSCレベル
1kHz OSC LEVEL ADJ.
1KHzチューニングOSCレベル
TR12 to 14 2SC2320(E,F)
TR15 to 17 2SC2320(E,F)
TR2b to 4b 2SC3383(S,T)
TR29, 30 2SC2320(E,F)
P15
70μ P.B EQ
TEST MUTE
TEST SIGNAL
GND
TO PRE AMP J25
シスコ
SYSC

TO SYSCON & TUNING DIAGRAM 1/2

(A) (B) to (Z) (AA) (AB)

BIAS OSC CIRCUIT REC MODE

		NORMAL	CrO2	METAL
IC4	2	5.4V	5.1V	5.8V
	3	2.9V	2.9V	2.9V
	4	2.9V	2.9V	2.9V
	6	5.4V	5.2V	5.8V
	7	5.4V	5.2V	5.8V
	8	7.1V	9.8V	18.4V

BIAS OSC CIRCUIT REC MODE

		NORMAL	CrO2	METAL
TR19	B	6.5V	9.2V	17.8V
TR54	C	7.1V	9.8V	18.4V
TR20	B	-0.5V	-1.0V	-2.7V
	C	6.5V	9.2V	17.8V
TR21	B	-0.7V	-1.3V	-2.9V
	C	6.5V	9.2V	17.8V

ERASE HEAD CIRCUIT REC MODE

	NORMAL	CrO2	METAL
TR37 B	7.3V	10.1V	18.5V
TR38 B	0.5V	0.5V	-0.4V
TR39 B	1.8V	1.7V	-0.6V
TR55 C	6.8V	9.5V	17.8V

=REC SIGNAL LINE 録音信号

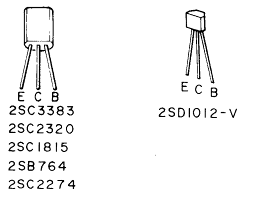
=TUNING TEST SIGNAL LINE チューニングテスト信号

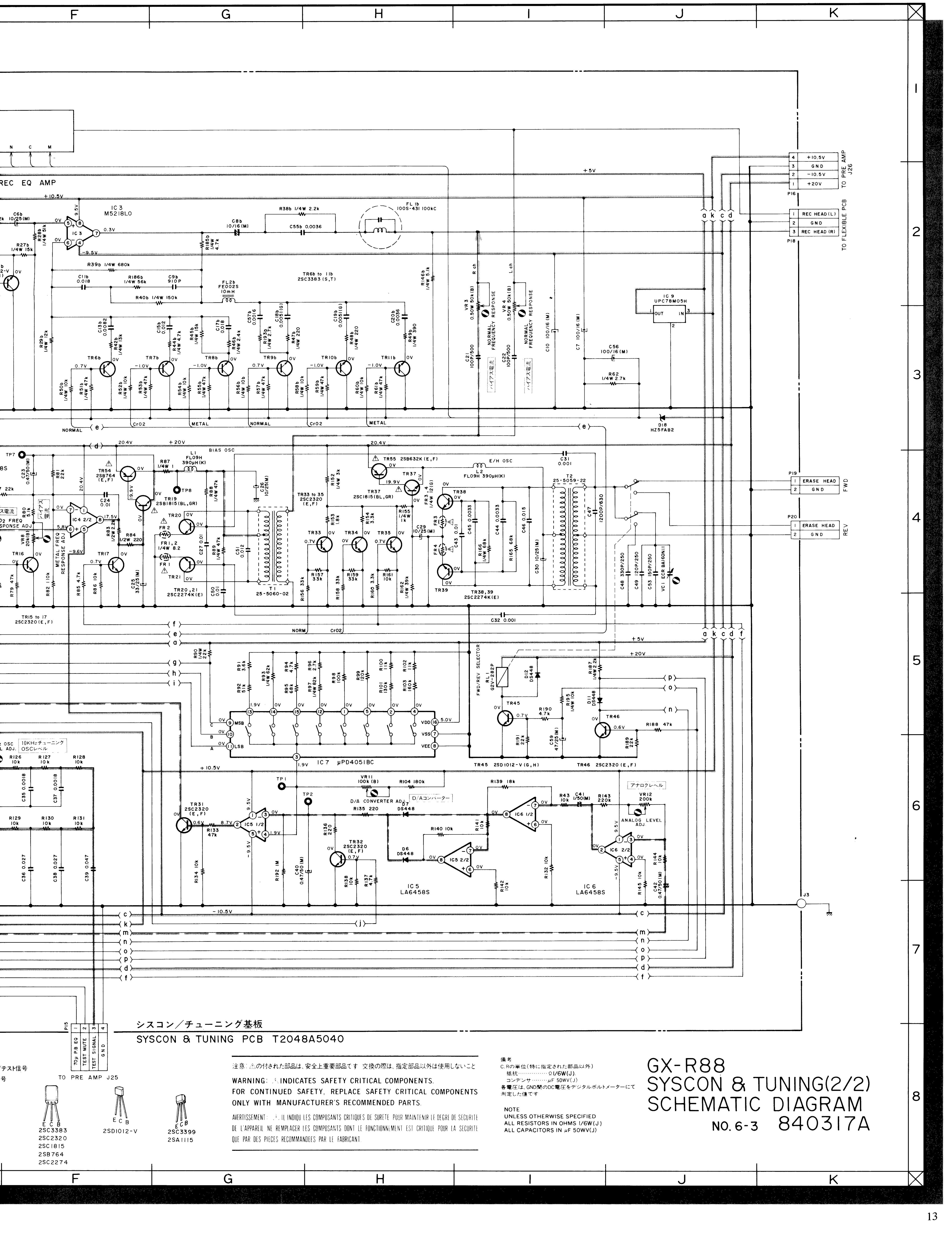
=TUNING PB DET LINE チューニング再生信号

=LEVEL CONTROL レベルコントロール信号

=BIAS CONTROL バイアスコントロール信号

= B (POWER SUPPLY) LINE B電源


E C B
2SC3383
2SC2320
2SC1815
2SB764
2SC2274
E C B
2SD1012-V


REC EQ AMP
IC3 M5218L0
FL1b 100S-431 100kC
TR6b to 11b 2SC3383 (S,T)
NORMAL
CrO2
METAL
NORMAL FREQUENCY RESPONSE
IC9 UPC78M05H
TO PRE AMP J26
+10.5V
GND
-10.5V
+20V
P16
REC HEAD (L)
REC HEAD (R)
P18
TO FLEXIBLE PCB
D18 HZ5FAB2
BIAS OSC
E/H OSC
TR55 2SB632K (E,F)
TR37 2SC1815 (BL,GR)
TR33 to 35 2SC2320 (E,F)
T1 25-5060-02
T2 25-5059-22
TR38,39 2SC2274K (E)
TR20,21 2SC2274K (E)
TR19 2SB1815 (BL,GR)
TR54 2SB764 (E,F)
IC4 2/2
TR15 to 17 2SC2320 (E,F)
ERASE HEAD
FWD
REV
P19
P20
VC1 ECR BA160N11
FWD/REV SELECTOR
RL1 G2V-282P
TR45 2SD1012-V (G,H)
TR46 2SC2320 (E,F)
IC7 μPD4051BC
MSB
LSB
VDD
VSS
VEE
10KHzチューニング OSCレベル
TR31 2SC2320 (E,F)
IC5 1/2
IC5 2/2
IC5 LA6458S
IC6 1/2
IC6 2/2
IC6 LA6458S
TR32 2SC2320 (E,F)
D/A CONVERTER ADJ
D/Aコンバーター
アナログレベル
ANALOG LEVEL ADJ
J3
P15
70μ PB EQ
TEST MUTE
TEST SIGNAL
GND
TO PRE AMP J25
2SC3383
2SC2320
2SC1815
2SB764
2SC2274
2SD1012-V
2SC3399
2SA1115

シスコン／チューニング基板

SYSCON & TUNING PCB T2048A5040

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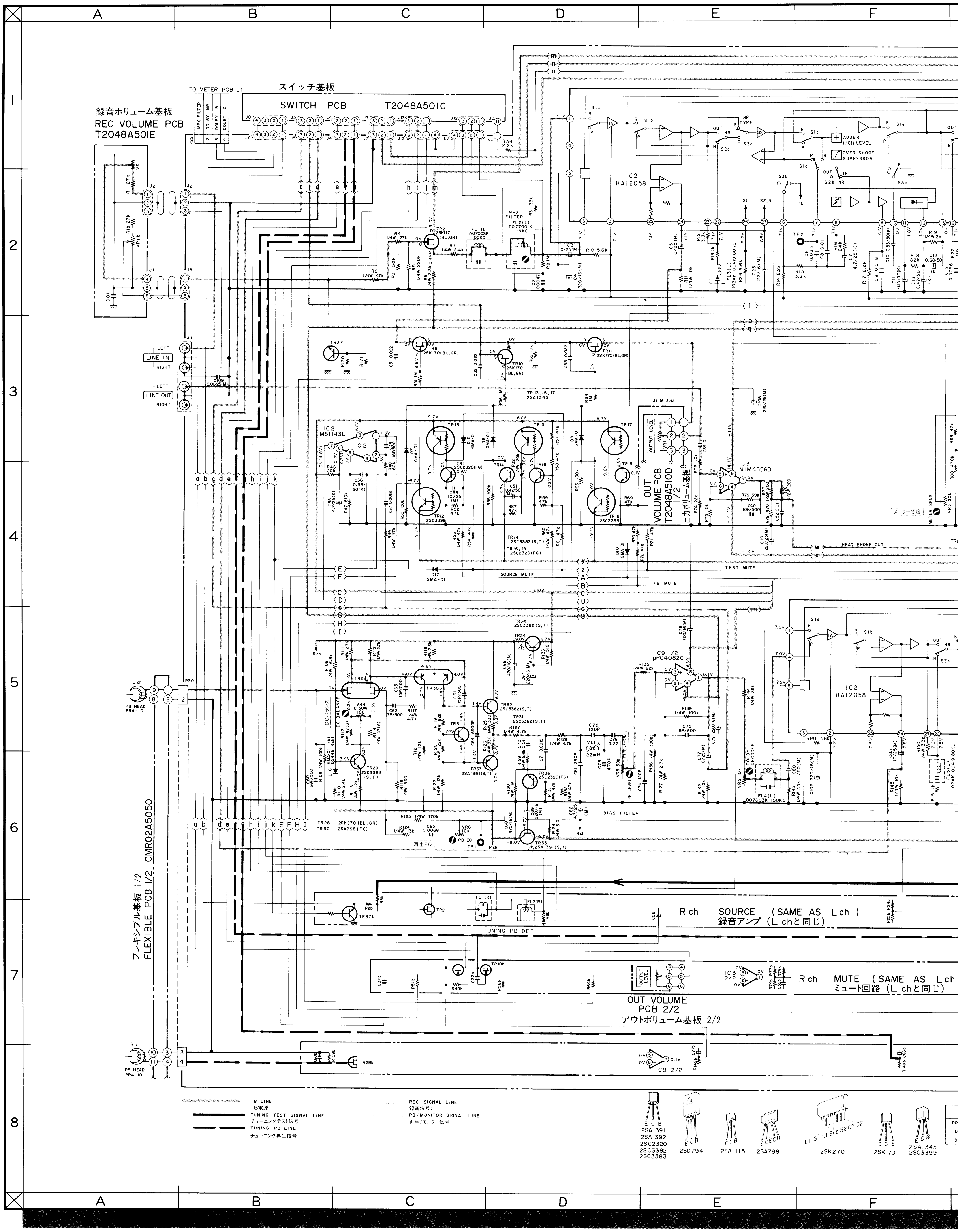
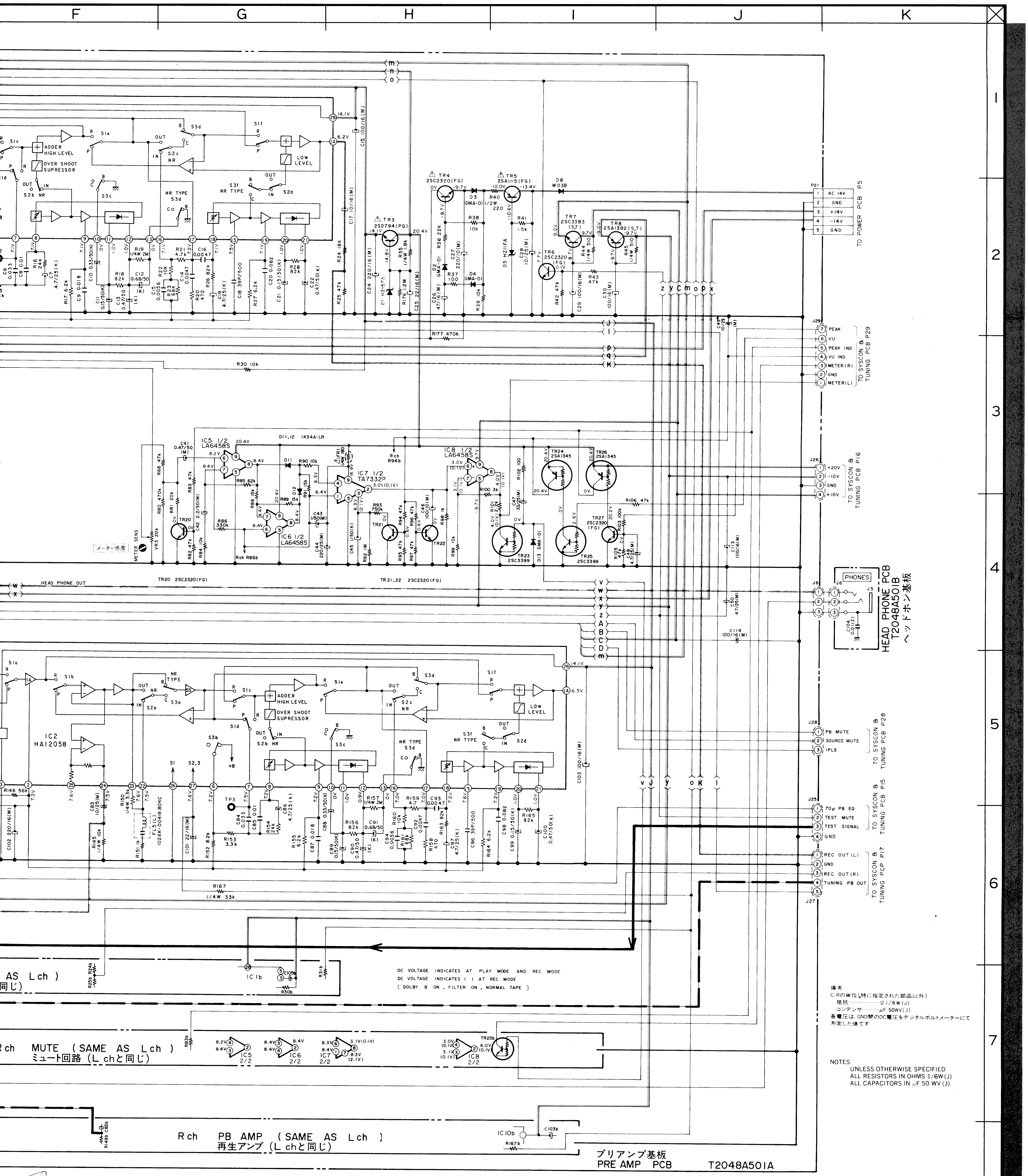
備考
C. Rの単位（特に指定された部品以外）
抵抗……………Ω1/6W(J).
コンデンサ………μF 50WV(J)
各電圧は、GND間のDC電圧をデジタルボルトメーターにて測定した値です

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(J)
ALL CAPACITORS IN μF 50WV(J)

GX-R88
SYSCON & TUNING(2/2)
SCHEMATIC DIAGRAM

NO. 6-3 840317A


A B C D E F
1 2 3 4 5 6 7 8
録音ボリューム基板
REC VOLUME PCB
T2048A50IE
TO METER PCB J1
スイッチ基板
SWITCH PCB T2048A501C
MPX FILTER
DOLBY NR
DOLBY B
DOLBY C
IC2 HA12058
NR TYPE
ADDER HIGH LEVEL
OVER SHOOT SUPRESSOR
MPX FILTER
FL1(L) D07003K 100KC
FL2(L) D07700IK 19KC
TP2
FL3(L) 102AK-0049.80KC
LINE IN LEFT RIGHT
LINE OUT LEFT RIGHT
TR37
TR9 2SK170(BL,GR)
TR10 2SK170(BL,GR)
TR11 2SK170(BL,GR)
TR13,15,17 2SA1345
IC2 M51143L
TR12 2SC3399
TR18 2SC3399
TR14 2SC3383(S,T)
TR16,19 2SC2320(FG)
J1 & J33
OUTPUT LEVEL
OUT VOLUME PCB T2048A510D 1/2
出力ボリューム基板
IC3 NJM4556D
メーター感度
METER SENS
HEAD PHONE OUT
TEST MUTE
SOURCE MUTE
PB MUTE
+10V
D17 GMA-01
TR34 2SC3382(S,T)
IC9 1/2 μPC4082C
Rch
L ch
PB HEAD PR4-10
P30
DC BALANCE
DCバランス
TR28
TR30
TR29 2SC3383(S,T)
TR32 2SC3382(S,T)
TR31 2SC3382(S,T)
TR33 2SA1391(S,T)
TR36 2SC2320(FG)
TR35 2SA1391(S,T)
VL1 22mH
PB LEVEL
再生レベル
DOLBY DECODER
FL4(L) D07003K 100KC
FL5(L) 102AK-0049.80KC
BIAS FILTER
TR28 2SK270(BL,GR)
TR30 2SA798(FG)
再生EQ
PB EQ
TP1
フレキシブル基板 1/2
FLEXIBLE PCB 1/2 CMR02A5050
TUNING PB DET
R ch SOURCE (SAME AS L ch)
録音アンプ (L chと同じ)
R ch MUTE (SAME AS L ch)
ミュート回路 (L chと同じ)
OUT VOLUME PCB 2/2
アウトボリューム基板 2/2
IC3 2/2
IC9 2/2
TR28b
B LINE
B電源
TUNING TEST SIGNAL LINE
チューニングテスト信号
TUNING PB LINE
チューニング再生信号
REC SIGNAL LINE
録音信号
PB/MONITOR SIGNAL LINE
再生/モニター信号
E C B
2SA1391
2SA1392
2SC2320
2SC3382
2SC3383
2SD794
2SA1115
2SA798
D1 G1 S1 Sub S2 G2 D2
2SK270
D G S
2SK170
2SA1345
2SC3399


F
G
H
I
J
K
1
2
3
4
5
6
7
8
TR3 2SD794(PQ)
TR4 2SC2320(FG)
TR5 2SA1115(FG)
D8 W03B
TR6 2SC2320 (FG)
TR7 2SC3383 (S,T)
TR8 2SA1392 (S,T)
P21
AC 14V
GND
+14V
-14V
GND
TO POWER PCB P5
J29
PEAK
VU
PEAK IND
VU IND
METER (R)
GND
METER (L)
TO SYSCON & TUNING PCB P29
IC5 1/2 LA6458S
IC6 1/2 LA6458S
IC7 1/2 TA7332P
IC8 1/2 LA6458S
D11,12 1K34A-LR
TR24 2SA1345
TR26 2SA1345
TR23 2SC3399
TR25 2SC3399
TR27 2SC2320 (FG)
TR20 2SC2320(FG)
TR21,22 2SC2320(FG)
J26
+20V
-10V
GND
+10V
TO SYSCON & TUNING PCB P16
メーター感度
METER SENS
HEAD PHONE OUT
J6
PHONES
J5
HEAD PHONE PCB T2048A501B
ヘッドホン基板
IC2 HA12058
ADDER HIGH LEVEL
OVER SHOOT SUPRESSOR
LOW LEVEL
NR TYPE
TP3
J28
PB MUTE
SOURCE MUTE
IPLS
TO SYSCON & TUNING PCB P28
J25
70μ PB EQ
TEST MUTE
TEST SIGNAL
GND
TO SYSCON & TUNING PCB P15
REC OUT (L)
GND
REC OUT (R)
TUNING PB OUT
J27
TO SYSCON & TUNING PCP P17
AS Lch)
同じ)
IC1b
DC VOLTAGE INDICATES AT PLAY MODE AND REC MODE
DC VOLTAGE INDICATES ( ) AT REC MODE
[DOLBY B ON , FILTER ON , NORMAL TAPE]
Rch MUTE (SAME AS Lch)
ミュート回路 (L chと同じ)
IC5 2/2
IC6 2/2
IC7 2/2
IC8 2/2
TR23b
Rch PB AMP (SAME AS Lch)
再生アンプ (L chと同じ)
IC10b
C103b
R167b
R149b
C83b

備考
C.Rの単位(特に指定された部品以外)
抵抗……………Ω 1/6W(J)
コンデンサ………μF 50WV(J)
各電圧は、GND間のDC電圧をデジタルボルトメーターにて測定した値です

NOTES
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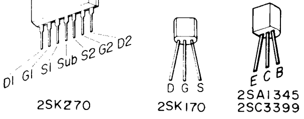
ALL CAPACITORS IN μF 50 WV (J)

プリアンプ基板
PRE AMP PCB T2048A501A


D1 G1 S1 Sub S2 G2 D2
2SK270
D G S
2SK170
E C B
2SA1345
2SC3399

	IC1 ㉗ IC10 ㉗
DOLBY OFF	5.5V
DOLBY B	7.6V
DOLBY C	9.4V

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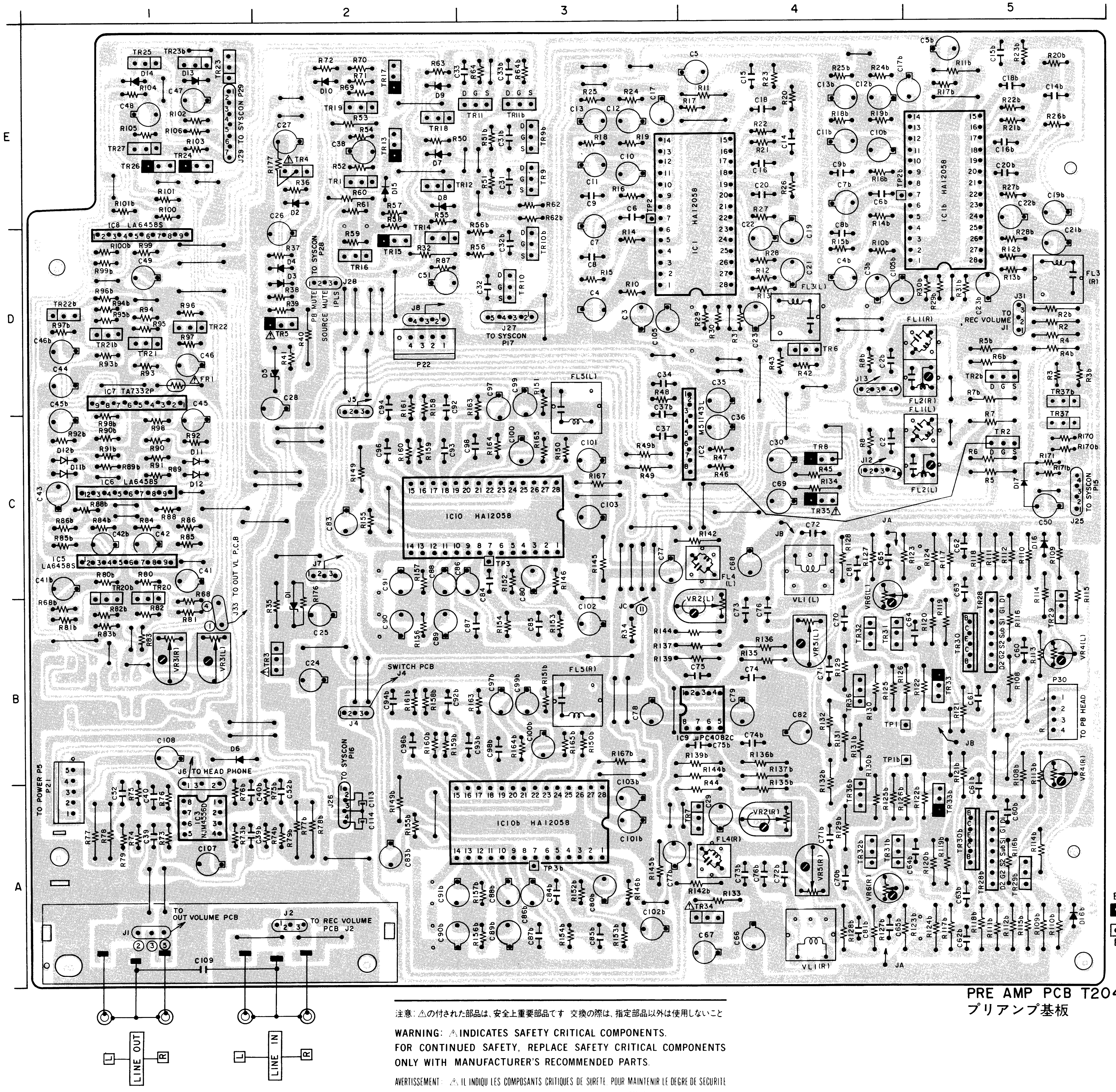
GX-R88 PRE AMP
SCHEMATIC DIAGRAM

NO. 6-4 831207B

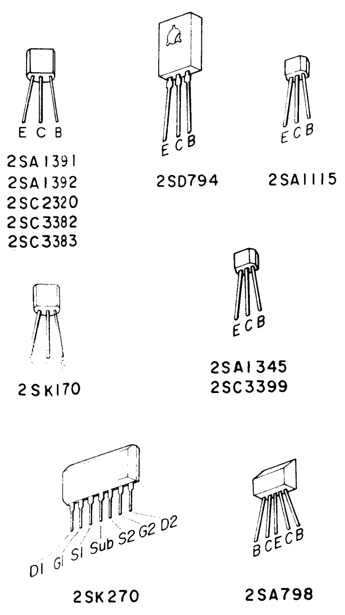
TR1,4,6,16,19,20 to22
27,36----2SC2320(F,G)
TR2-------------------2SK117(BL,GR)
TR3-------------------2SD794(P,Q)
TR5-------------------2SA1115(F,G)
TR7,14,29,37-----------2SC3383(S,T)
TR8-------------------2SA1392(S,T)
TR9 to 11---------------2SK170(BL,GR)
TR12,18,23,25-----2SC3399
TR13,15,17,24,26---2SA1345
TR28--------------2SK270(BL,GR)
TR30--------------2SA798(F,G)
TR31,32,34--------2SC3382(S,T)
TR33,35-----------2SA1391(S,T)

FL1(L),FL1(R),VL1(L),VL1(R)---BIAS FILTER
FL2(L),FL2(R)--------------MPX FILTER

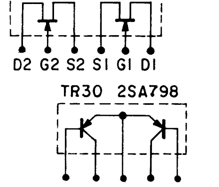
VR2(L),VR2(R)----DOLBY DECODER
VR3(L),VR3(R)----METER SENS
VR4(L),VR4(R)----DC BALANCE
VR5(L),VR5(R)----PB LEVEL
VR6(L),VR6(R)----PB EQ


1
2
3
4
5
E
D
C
B
A
IC1 HA12058
IC1b HA12058
IC2 M51143L
IC5 LA6458S
IC6 LA6458S
IC7 TA7332P
IC8 LA6458S
IC9 μPC4082C
IC10 HA12058
IC10b HA12058
IC3 NJM4560
J29 TO SYSCON P29
TO SYSCON P28
PB MUTE
SOURCE MUTE
(PLS)
J28
J8
P22
J27 TO SYSCON P17
TO REC VOLUME J1
J31
J13
J12
J25 TO SYSCON P15
FL3(L)
FL3(R)
FL1(R)
FL2(R)
FL1(L)
FL2(L)
FL4(L)
FL4(R)
FL5(L)
FL5(R)
VL1(L)
VL1(R)
VR2(L)
VR2(R)
VR3(R)
VR3(L)
VR4(L)
VR4(R)
VR5(L)
VR5(R)
VR6(L)
VR6(R)
J5
J7
J33 TO OUT VL P.C.B
SWITCH PCB J4
J4
P30 TO PB HEAD
TO POWER P5 P21
J6 TO HEAD PHONE
J26 TO SYSCON P16
J1 TO OUT VOLUME PCB
J2 TO REC VOLUME PCB J2
C109
JA
JB
JC
TP1
TP1b
TP2
TP2b
TP3
TP3b
LINE OUT
LINE IN
L
R

PRE AMP PCB T2048A501A
プリアンプ基板


E C B
2SA1391
2SA1392
2SC2320
2SC3382
2SC3383
E C B
2SD794
E C B
2SA1115
2SK170
E C B
2SA1345
2SC3399
D1 G1 S1 Sub S2 G2 D2
2SK270
B C E C B
2SA798

B ■●● =PNP TRANSISTOR
●●● =NPN TRANSISTOR
B


TR28 2SK270A
D2 G2 S2 S1 G1 D1
TR30 2SA798
B C E C B

→⊳|- GERMANUM DIODE
→▶|- SILICON DIODE

LOCATION OF COMPONENTS

IC'S

IC1	E4
IC1b	E5
IC2	C4
IC3	A1
IC5	C1
IC6	C1
IC7	D1
IC8	D1
IC9	B4
IC10	C3
IC10b	A3

TRANSISTORS

TR1	E2
TR2	C5
TR2b	D5
TR3	B2
TR4	E2
TR5	D2
TR6	D4
TR7	A4
TR8	C4
TR9	E3
TR9b	E3
TR10	D3
TR10b	D3
TR11	E3
TR11b	E3
TR12	E2
TR13	E2
TR14	D2
TR15	D2
TR16	D2
TR17	E2
TR18	E2
TR19	E2
TR20	C1
TR20b	C1
TR21	D1
TR21b	D1
TR22	D1
TR22b	D1
TR23	E1
TR23b	E1
TR24	E1
TR25	E1
TR26	E1
TR27	E1
TR28	B5
TR28b	A5
TR29	B5
TR29b	A5
TR30	B5
TR30b	A5
TR31	B4
TR31b	A4
TR32	B4
TR32b	A4
TR33	B5
TR33b	A5
TR34	A4
TR35	C4
TR36	B4
TR36b	A4
TR37	C5
TR37b	C5

TERMINALS

J2	A2
J4	B2
J5	D2
J6	A1
J7	C2
J8	D2
J12	C4
J13	D4
J24	B1
J25	C5
J26	A2
J27	D3
J28	D2
J29	E1
J31	D5
J32	B1
J33	B1
P21	A1
P22	D2
P30	B5

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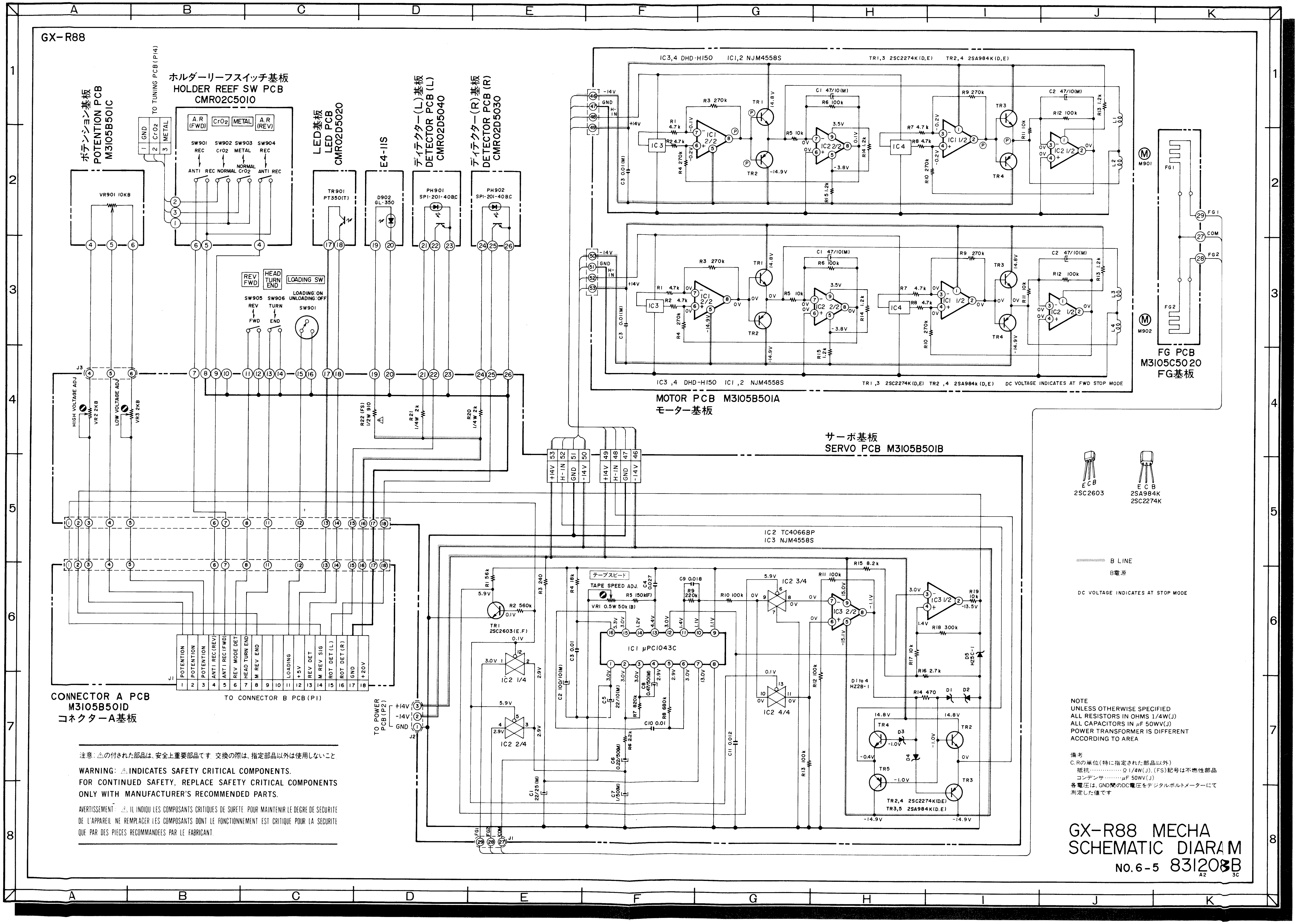
GX-R88
ポテンション基板
POTENTION PCB
M3105B501C
VR901 10KB
TO TUNING PCB (P14)
GND
CrO2
METAL
ホルダーリーフスイッチ基板
HOLDER REEF SW PCB
CMR02C5010
A.R (FWD)
CrO2
METAL
A.R (REV)
SW901 REC
SW902 CrO2
SW903 METAL
SW904 REC
ANTI REC NORMAL NORMAL CrO2 ANTI REC
LED基板
LED PCB
CMR02D5020
TR901 PT350(T)
E4-11S
D902 GL-350
ディテクター(L)基板
DETECTOR PCB (L)
CMR02D5040
PH901 SPI-201-40BC
ディテクター(R)基板
DETECTOR PCB (R)
CMR02D5030
PH902 SPI-201-40BC
REV FWD
HEAD TURN END
LOADING SW
SW905 REV FWD
SW906 TURN END
LOADING:ON UNLOADING:OFF
SW901
HIGH VOLTAGE ADJ VR2 2k B
LOW VOLTAGE ADJ VR3 2k B
R22 (FS) 1/2W 910
R21 1/4W 2k
R20 1/4W 2k
IC3,4 DHD-H150 IC1,2 NJM4558S
TR1,3 2SC2274K(D,E) TR2,4 2SA984K(D,E)
MOTOR PCB M3105B501A
モーター基板
DC VOLTAGE INDICATES AT FWD STOP MODE
M901
M902
FG PCB
M3105C5020
FG基板
FG1 COM FG2
サーボ基板
SERVO PCB M3105B501B
+14V H-IN GND -14V
2SC2603
E C B
2SA984K
2SC2274K
B LINE
B電源
DC VOLTAGE INDICATES AT STOP MODE
IC2 TC4066BP
IC3 NJM4558S
TR1 2SC2603(E.F)
テープスピード
TAPE SPEED ADJ.
VR1 0.5W 50k (B)
IC1 μPC1043C
D1 to 4 HZ2B-1
D5 HZ5C-1
TR2,4 2SC2274K(D.E)
TR3,5 2SA984K(D.E)
TO POWER PCB (P2)
+14V -14V GND
POTENTION
ANTI REC (REV)
ANTI REC (FWD)
REV MODE DET
HEAD TURN END
M REV END
LOADING
+5V
REV DET
M REV SIG
ROT DET (L)
ROT DET (R)
GND
+20V
CONNECTOR A PCB
M3105B501D
コネクターA基板
TO CONNECTOR B PCB (P1)

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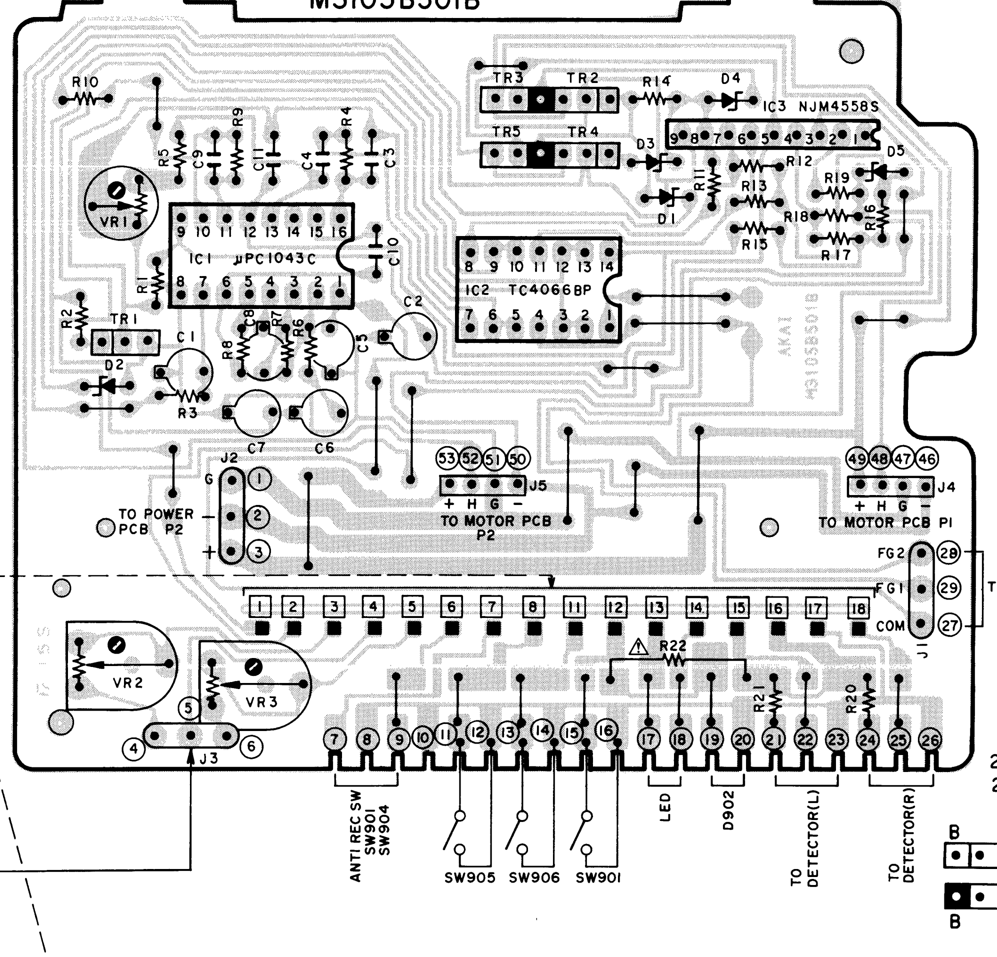
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/4W(J)
ALL CAPACITORS IN μF 50WV(J)
POWER TRANSFORMER IS DIFFERENT
ACCORDING TO AREA

備考
C.Rの単位(特に指定された部品以外)
抵抗……………Ω 1/4W(J)，(FS)記号は不燃性部品
コンデンサ………μF 50WV(J)
各電圧は、GND間のDC電圧をデジタルボルトメーターにて測定した値です

GX-R88 MECHA
SCHEMATIC DIARAM

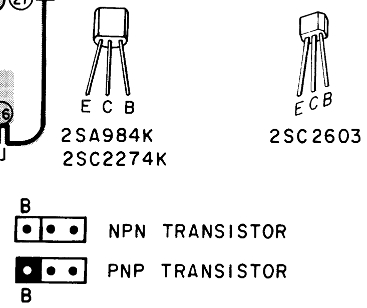
NO.6-5 831203B
A2 3C

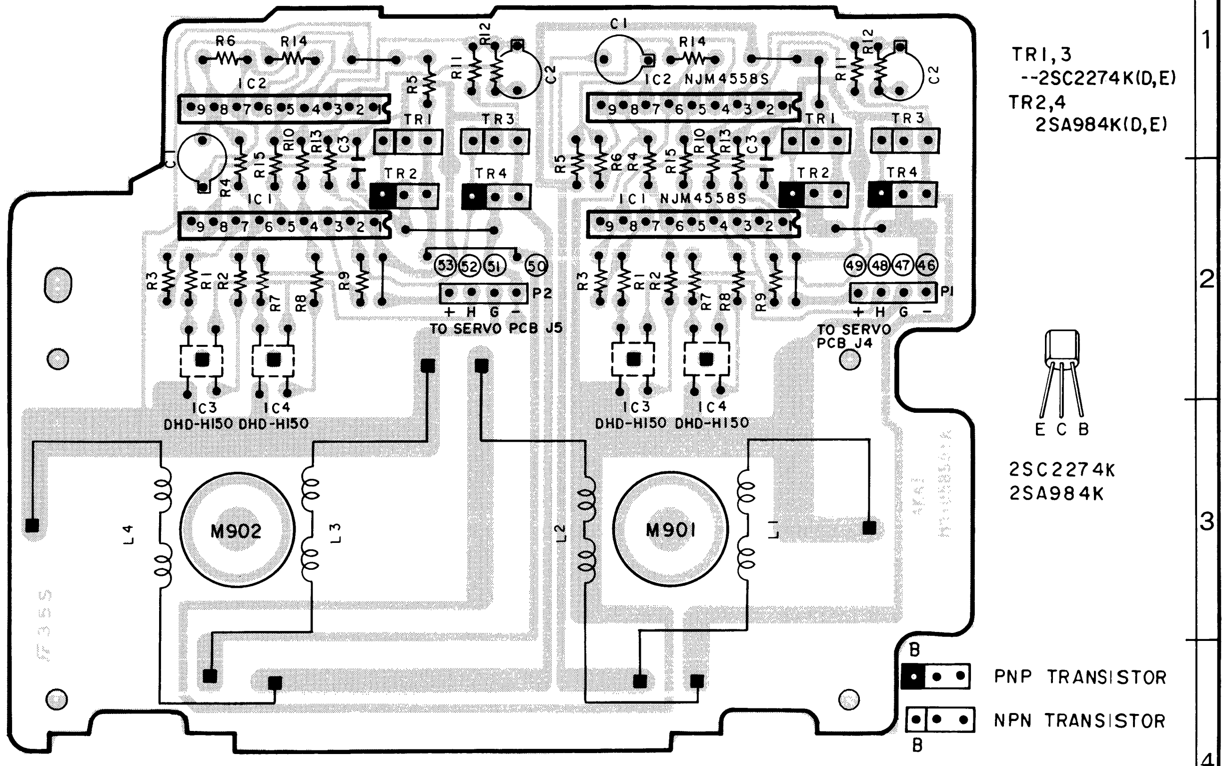
サーボ基板
SERVO PCB
M3105B501B


VR1
VR2
VR3
IC1 μPC1043C
IC2 TC4066BP
IC3 NJM4558S
TR1
TR2
TR3
TR4
TR5
J2
TO POWER PCB P2
J5
TO MOTOR PCB P2
J4
TO MOTOR PCB P1
J1
FG2
FG1
COM
TO FG PCB
J3
R22
ANTI REC SW SW901 SW904
SW905
SW906
SW901
LED
D902
TO DETECTOR(L)
TO DETECTOR(R)
AKAI M3105B501B

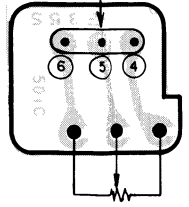
TR1--------2SC2603(E,F)
TR2,4-----2SC2274K(D,E)
TR3,5-----2SA984K(D,E)

VR1-------TAPE SPEED ADJUSTMENT
VR2-------HIGH VOLTAGE ADJUSTMENT
VR3--------LOW VOLTAGE ADJUSTMENT

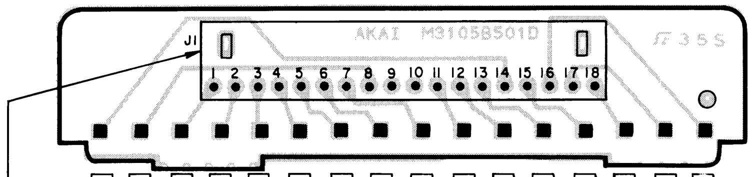

E C B
2SA984K
2SC2274K
E C B
2SC2603
B
NPN TRANSISTOR
PNP TRANSISTOR
B


TR1,3 --2SC2274K(D,E)
TR2,4 2SA984K(D,E)
IC1 NJM4558S
IC2 NJM4558S
IC3 DHD-H150
IC4 DHD-H150
TO SERVO PCB J5
TO SERVO PCB J4
P1
P2
M902
M901
L1
L2
L3
L4
E C B
2SC2274K
2SA984K
B
PNP TRANSISTOR
NPN TRANSISTOR
B

(CAPSTAN) MOTOR PCB M3105B501A
モーター基板



POTENTION PCB
M3105B501C
ポテンション基板


J1
AKAI M3105B501D

コネクターA基板
CONNECTOR A PCB
M3105B501D

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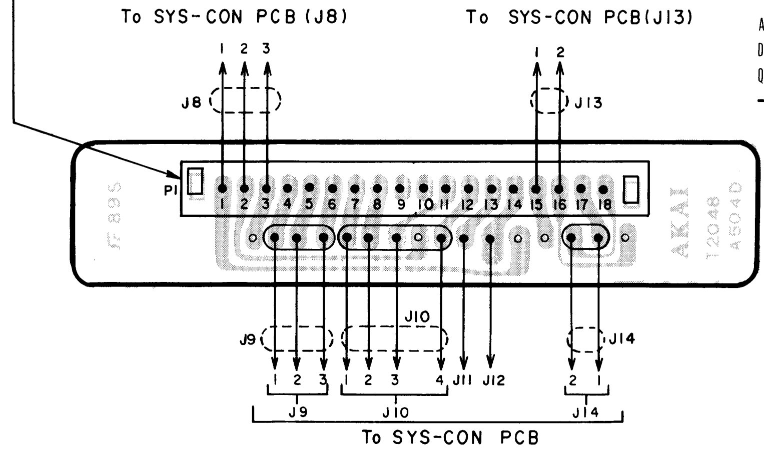
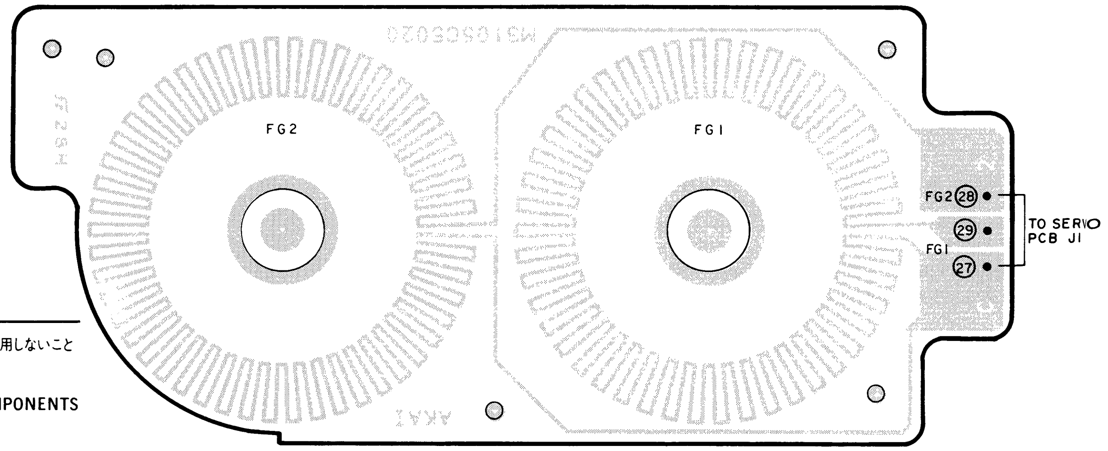
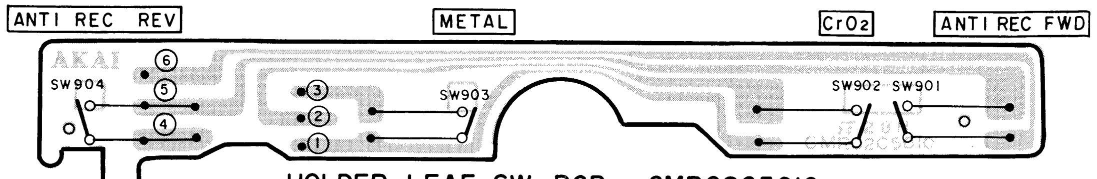

To SYS-CON PCB (J8)
To SYS-CON PCB (J13)
J8
J13
P1
AKAI T2048 A504D
J9
J10
J11
J12
J14
To SYS-CON PCB

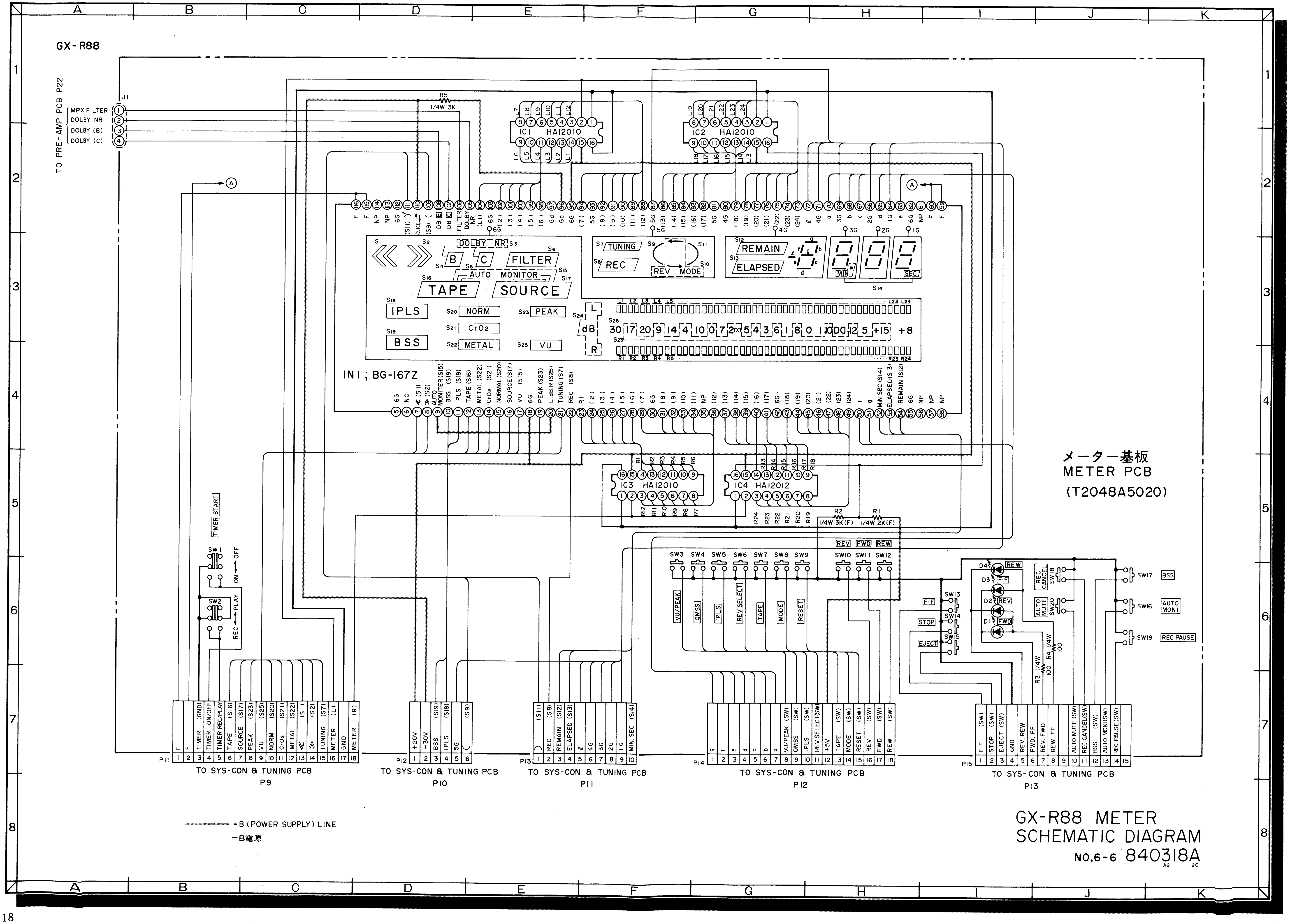
コネクターB基板
CONNECTOR B PCB
T2048A504D


M3105C5020
FG2
FG1
TO SERVO PCB J1
AKAI

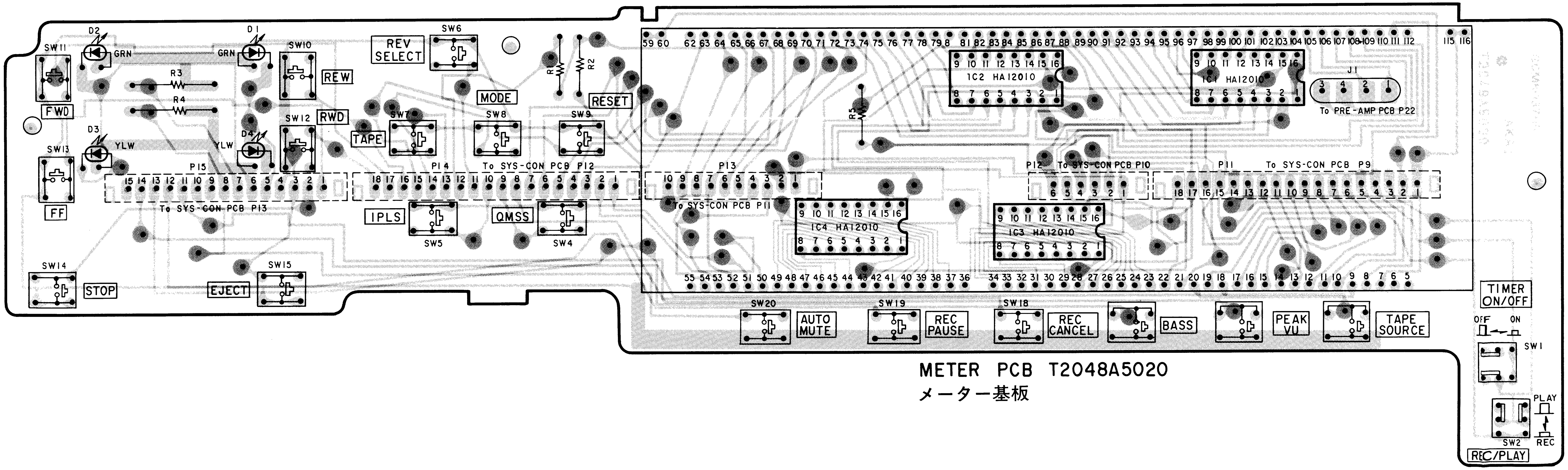
FG PCB M3105C5020
FG基板


ANTI REC REV
METAL
CrO2
ANTI REC FWD
SW904
SW903
SW902
SW901

HOLDER LEAF SW PCB CMR02C5010
ホルダーリーフスイッチ基板


GX-R88
TO PRE-AMP PCB P22
J1
MPX FILTER
DOLBY NR
DOLBY (B)
DOLBY (C)
R5 1/4W 3K
IC1 HA12010
IC2 HA12010
IC3 HA12010
IC4 HA12012
IN1 ; BG-167Z
DOLBY NR
B
C
FILTER
AUTO MONITOR
TAPE
SOURCE
IPLS
BSS
NORM
CrO2
METAL
PEAK
VU
dB
L
R
TUNING
REC
REV MODE
REMAIN
ELAPSED
MIN
SEC
30 17 20 9 14 4 10 0 7 2 5 4 3 6 1 8 0 1 0 2 5 +15 +8
メーター基板
METER PCB
(T2048A5020)
R2 1/4W 3K(F)
R1 1/4W 2K(F)
REV FWD REW
SW3 SW4 SW5 SW6 SW7 SW8 SW9 SW10 SW11 SW12
VU/PEAK
QMSS
IPLS
REV SELECT
TAPE
MODE
RESET
TIMER START
SW1
ON OFF
SW2
REC PLAY
SW13 SW14 SW15
F·F
STOP
EJECT
D1 D2 D3 D4
REW
F·F
REV
FWD
REC CANCEL SW18
AUTO MUTE SW20
R3 1/4W 100
R4 1/4W 100
SW17 BSS
SW16 AUTO MONI
SW19 REC PAUSE
P11
F F (GND) TIMER ON/OFF TIMER REC/PLAY TAPE (S16) SOURCE (S17) PEAK (S23) VU (S25) NORM (S20) CrO2 (S21) METAL (S22) ≪ (S1) ≫ (S2) TUNING (S7) METER (L) GND METER (R)
TO SYS-CON & TUNING PCB
P9
P12
+20V +30V BSS (S19) IPLS (S18) 5G ((S9)
TO SYS-CON & TUNING PCB
P10
P13
) (S11) REC (S8) REMAIN (S12) ELAPSED (S13) ℓ 4G 3G 2G 1G MIN. SEC (S14)
TO SYS-CON & TUNING PCB
P11
P14
g f e d c b a VU/PEAK (SW) QMSS (SW) IPLS (SW) REV SELECT(SW) +5V TAPE (SW) MODE (SW) RESET (SW) REV (SW) FWD (SW) REW (SW)
TO SYS-CON & TUNING PCB
P12
P15
F·F (SW) STOP (SW) EJECT (SW) GND REV. REW FWD. FF REV. FWD REW. FF AUTO MUTE (SW) REC CANCEL(SW) BSS (SW) AUTO MONI(SW) REC PAUSE(SW)
TO SYS-CON & TUNING PCB
P13
= B (POWER SUPPLY) LINE
= B電源
A B C D E F G H I J K
1 2 3 4 5 6 7 8

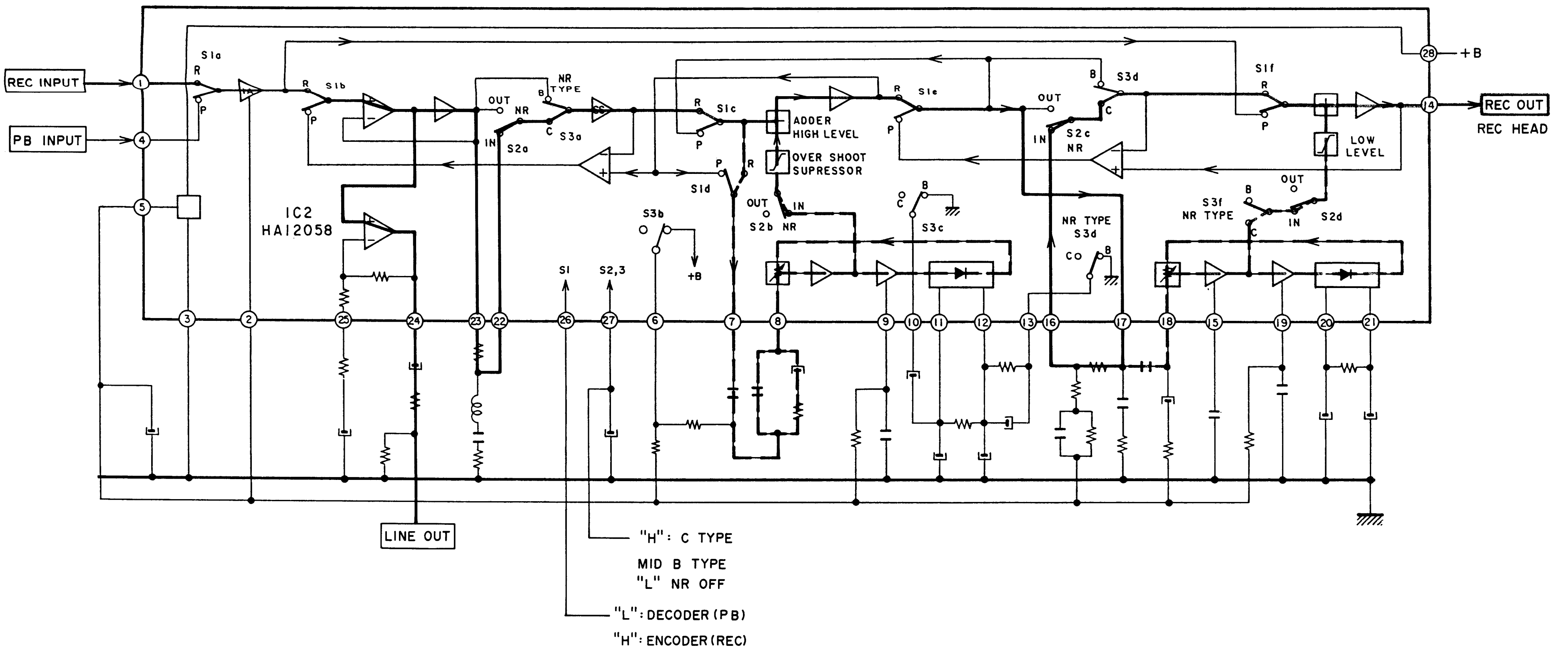
GX-R88 METER
SCHEMATIC DIAGRAM
NO.6-6 840318A


SW11
FWD
D2
GRN
D1
GRN
SW10
REW
R3
R4
SW12
RWD
D3
YLW
D4
YLW
SW13
FF
P15
To SYS-CON PCB P13
SW14
STOP
EJECT
SW15
REV SELECT
SW6
TAPE
SW7
MODE
SW8
R1
R2
RESET
SW9
P14
To SYS-CON PCB P12
IPLS
SW5
QMSS
SW4
P13
To SYS-CON PCB P11
IC2 HA12010
IC1 HA12010
J1
To PRE-AMP PCB P22
R5
IC4 HA12010
IC3 HA12010
P12
To SYS-CON PCB P10
P11
To SYS-CON PCB P9
SW20
AUTO MUTE
SW19
REC PAUSE
SW18
REC CANCEL
BASS
PEAK VU
TAPE SOURCE
TIMER ON/OFF
OFF
ON
SW1
PLAY
SW2
REC
REC/PLAY

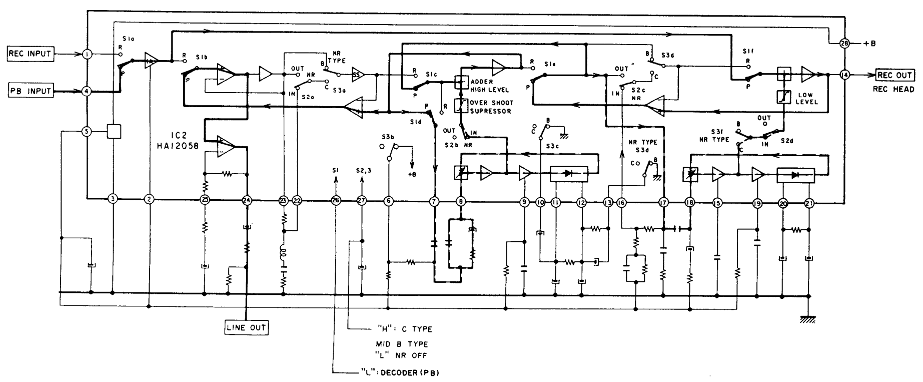
METER PCB T2048A5020
メーター基板

DOLBY IC (HA12038 HA12058) SIGNAL LINE

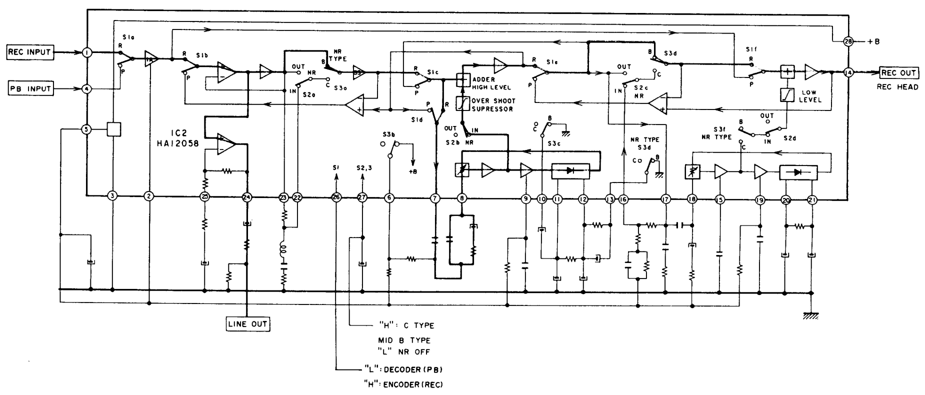
DOLBY C "ON" REC MODE（ドルビーC録音）


REC INPUT
PB INPUT
S1a
R
P
S1b
IC2
HA12058
OUT
NR
IN
S2a
NR TYPE
B
C
S3a
S1c
ADDER
HIGH LEVEL
OVER SHOOT
SUPRESSOR
S1d
S3b
+B
OUT
IN
S2b NR
S1e
S3c
OUT
IN
S2c
NR
NR TYPE
S3d
S3d
S1f
S3f
NR TYPE
S2d
LOW LEVEL
REC OUT
REC HEAD
+B
S1
S2,3
LINE OUT
"H": C TYPE
MID B TYPE
"L" NR OFF
"L": DECODER (PB)
"H": ENCODER (REC)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

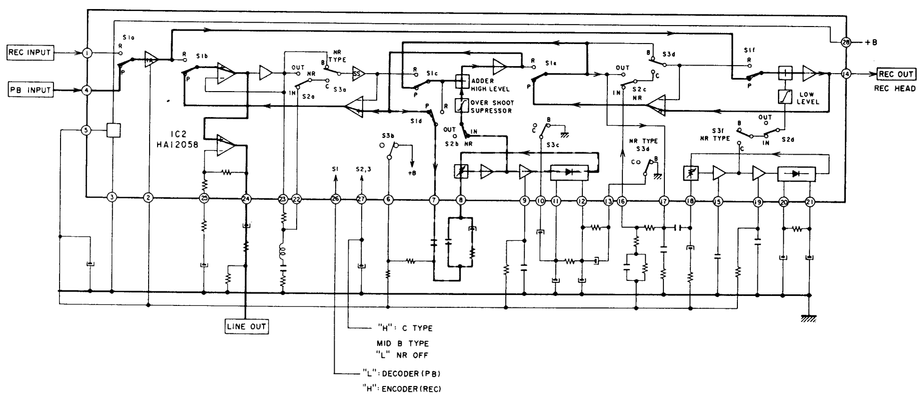
DOLBY C P.B MODE（ドルビーC再生）



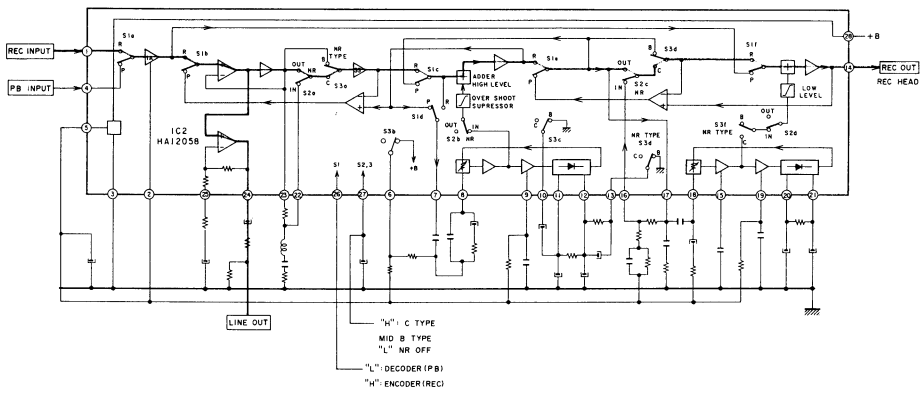
DOLBY B REC MODE（ドルビーB録音）



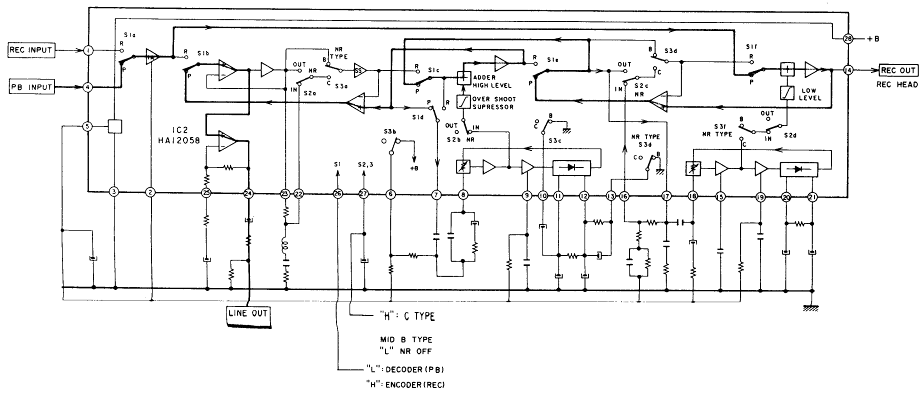
DOLBY B P.B MODE（ドルビーB再生）



DOLBY "OFF" REC MODE（ドルビーOFF録音）



DOLBY "OFF" P.B MODE（ドルビーOFF再生）



AKAI WERKSTATTHANDBUCH

Da dieses Wartungshandbuch bereits auf Englisch veröffentlicht ist und Einstell- und Zeichnungshinweise auf Deutsch enthält, empfiehlt es sich, diese Ausgabe des Handbuchs zusammen mit der bereits veröffentlichten englischen Ausgabe und den Stromlaufplänen zu verwenden.

STEREOCASSETTENDECK

MODEL GX-R88

I. TECHNISCHE DATEN

Spursystem	Kompaktcassette, Stereo
Motoren	FG-Servo-Direktantriebsmotor für Tonrollentrieb x 2 Gleichstrommotor für Spulentrieb x 2 Gleichstrommotor für Antrieb des Mechanismus x 1
Tonköpfe	Super-GX-Kopf für Aufnahme x 1 Super-GX-Kopf für Wiedergabe x 1 Löschkopf x 2
Gleichlaufschwankungen	0,028%(WRMS), 0,08%WTD (DIN)
Bandumspulzeit	90 Sek. (mit einer C-60 Cassette)
Verzerrung	0,5% (Reineisen)
Frequenzgang	Reineisen 20Hz bis 21000Hz ±3dB Chrom 20Hz bis 19 000Hz ±3dB Normal 20Hz bis 18 000Hz ± 3dB
Rauschabstand	Reineisen 60dB Mit Dolby Typ C: Verbessert bis zu 15dB bei 500Hz, 20dB bei 1 kHz bis 10kHz Mit Dolby Typ B: Verbessert bis zu 5dB bei 1kHz, 10dB oberhalb 5kHz
Eingang	LINE IN 70mV/47kOhm
Ausgang	LINE OUT 410mV/250 Ohm PHONES 1,3mW/8 Ohm
Stromversorgung	120V, 60Hz für USA & Kanada 220V, 50Hz für Europa ausschl. GB 240V, 50Hz für GB & Australien 110/120/220/240V, 50/60Hz, umschaltbar für andere Länder
Abmessungen	440(B) x 105(H) x 372(T) mm
Gewicht	7,6kg

* Änderungen der technischen Daten und des Designs zum Zwecke der Verbesserung vorbehalten.

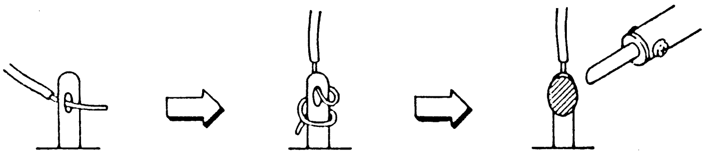
II. SICHERHEITSHINWEISE

SICHERHEITSKONTROLLE NACH WARTUNGSARBEITEN

Sicherstellen, daß der vorgegebene Isolierwinderstand zwischen den Stifen des Netzkabelsteckers und den äußeren, freiliegenden Gehäuseteilen mehr als 10 MOhm beträgt; hingegen soll bei Geräten mit Klemmen für Außenantennen (Tuner, Receiver usw.), die für $\boxed{C}$ oder $\boxed{A}$ vorgesehen sind, der vorgegebene Isolierwinderstand mehr als 2,2 MOhm (Erdungsklemmen, Mikrophonbuchsen, Kopfhörerbuchsen, (Line-in-out-Buchsen usw.) betragen.

BEI WARTUNGSARBEITEN ZU BEACHTENDE VORSICHTSMASSNAHMEN

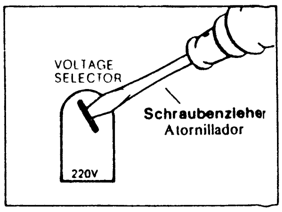
1. Bei mit dem Symbol markierten Teilen sind die Sicherheitsvorschriften besonders sorgfältig zu beachten.
   Den Austausch nur gegen Teile mit vorgeschriebener Teilenummer vornehmen.
2. Abgesehen von Sicherheitsmarkierungen werden sonstige Teile und Einheiten spezifiziert im Hinblick auf Übereinstimmung mit Regelungen, wie z.B. für Nebenausstrahlung, auch solche Teile dürfen nur gegen vorgeschriebene Austauschteile ausgetauscht werden.
   Beispiele: Hf-Umsetzer, Tunereinheiten, Antennenwahlschalter, Hf-Kabel, rausch unterdrückende Kondensatoren, rauschunterdrückende Filter usw.
3. Die vorgeschriebene interne Verdrahtung verwenden. Insbesondere auf Folgendes achten:
   1) mit PVC-Kabelschutzrohr versehene Leitungen
   2) doppelt isolierte Leitungen
   3) Hochspannungsleitungen
4. Für Teile, die gefährlich hohe Spannungen führen, nur die vorgeschriebenen Isoliermaterialien verwenden. Dabei ist besonders zu achten auf:
   1) Isolierband
   2) PVC-Kabelschutzrohr
   3) Abstandhalter (Isoliersperren)
   4) Isolierfolien für Transistoren
   5) Plastikschrauben zur Befestigung von Mikroschaltern (insbesondere bei Plattenspielern)
5. Beim Austauschen von Komponenten auf der Netzspannung-Primärseite (Transformatoren, Netzkabel, rauschunterdrückende Kondensatoren usw.) sind die Kabelenden vor dem Verlöten vorschriftsmäßig um die Klemmen zu wickeln.



6. Darauf achten, daß Leitungen nicht in Kontakt mit wärmeproduzierenden Teilen geraten (z.B. Kühlkörpern, Metalloxidfolien-Wiederständen, unterbrechbaren Wiederstände usw.)
7. Sicherstellen, daß beim Austausch von Leitungen diese nicht in Kontakt mit scharfen Kanten oder spitzen Teilen geraten.
8. Desgleichen die Bereiche in der Umgebung von Stellen, an denen repariert wurde, überprüfen.
9. Darauf achten, daß keine Fremdkörper (Schrauben, Lot usw.) innerhalb des Gerätes verbleiben.

III. SPANNUNGSUMSTELLUNG

3-1 SPANNUNGSUMSTELLUNG



Modelle für Kanada, USA, Europa, Großbritannien und Australien sind nicht mit dieser Einrichtung ausgestattet. Jedes Gerät wird im Werk dem Bestimmungsort entsprechend eingestellt. Manche Geräte können aber, falls notwendig, auf 110V, 120V, 220V oder 240V umgestellt werden. Falls die Spannung des Geräts umgeschaltet werden kann:

1. Netzkabel herausziehen.
2. Den Spannungswähler (VOLTAGE SELECTOR) auf der Geräterückseite mit einem schraubenzieher so drehen, daß die korrekte Netzspannung angezeigt wird.

V. MECHANISCHE EINSTELLUNG

5-1 MESSUNG DES ANDRUCKROLLENDRUCKS (Siehe Abb. 5-1)

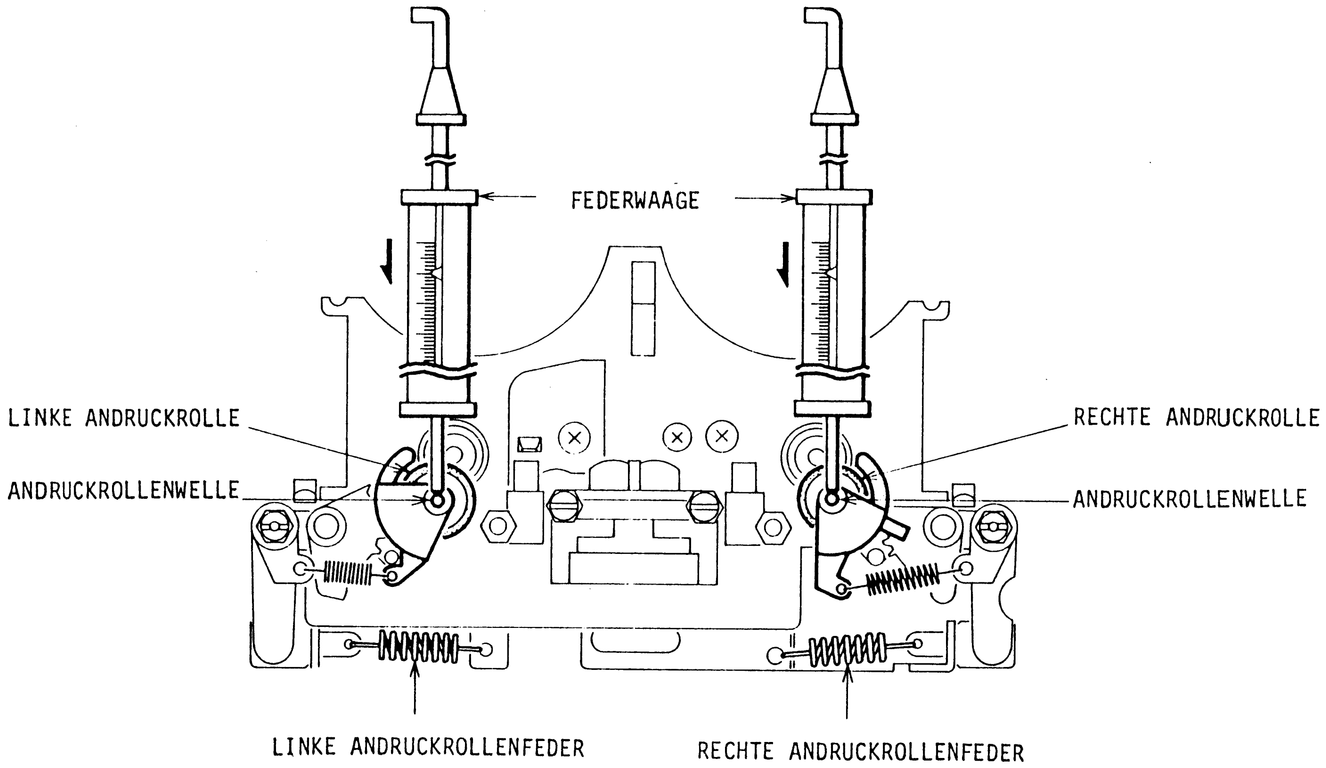

FEDERWAAGE
LINKE ANDRUCKROLLE
ANDRUCKROLLENWELLE
RECHTE ANDRUCKROLLE
ANDRUCKROLLENWELLE
LINKE ANDRUCKROLLENFEDER
RECHTE ANDRUCKROLLENFEDER

Abb. 5-1

Das Gerät auf FWD PLAY schalten. Die Andruckrollenwelle mit der Federwaage so herunterdrücken, daß ein Abstand von 1∿2 mm zwischen Andruckrolle und Capstan entsteht. Anschließend den Druck vermindern, bis sich die Andruckrolle wieder zu drehen beginnt. In diesem Zustand den Wert ablesen. Der vorgeschriebene Andruck beträgt.

RECHTE SEITE: 450 ± 80g
LINKE SEITE: 400 ± 80g

Sicherstellen, daß der Andruckrollendruck bei REV PLAY

RECHTE SEITE: 400 ± 80g
LINKE SEITE: 450 ± 80g

beträgt. Falls dieser Wert nicht erreicht wird, ist die Andruckrollenfeder auszutauschen.

5-2 WICKEL-DREHMOMENT IN ALLEN BETRIEBSARTEN (Siehe Abb. 5-2)

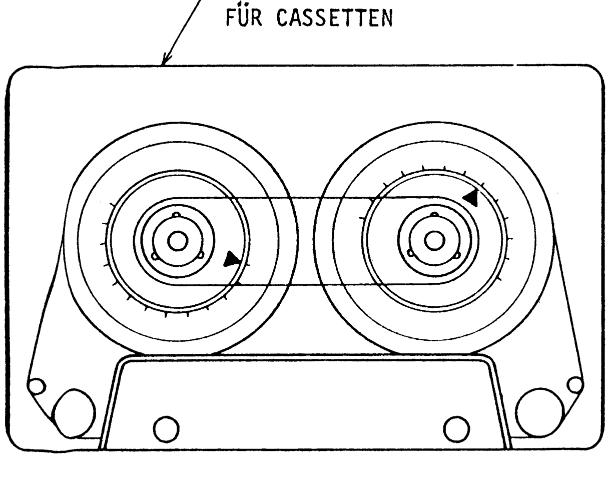

DREHMOMENT-MESSGERÄT FÜR CASSETTEN

Abb. 5-2

Ein Cassetten-Drehmoment-Meßgerät (AJ-751179) einlegen und die Messung in allen Betriebsarten durchführen. Die Messung des schnellen Vor- und Rücklaufs am Bandende d.h. nach Stoppen des Bandlaufs ausführen.

Vorlauf- oder Reverse-Betriebsart

Aufwickeldrehmoment: 40^{+15}_{-10} g-cm

Abwickelzug-Drehmoment: 17 ± 3 g-cm

Betriebsart Schneller Vor und Rücklauf

Aufwickeldrehmoment: 100^{+50}_{-30} g-cm

5-3 EINSTELLUNG DES REGLERS (VR901) UND DES KURVENRADES (Siehe Abb. 5-3)

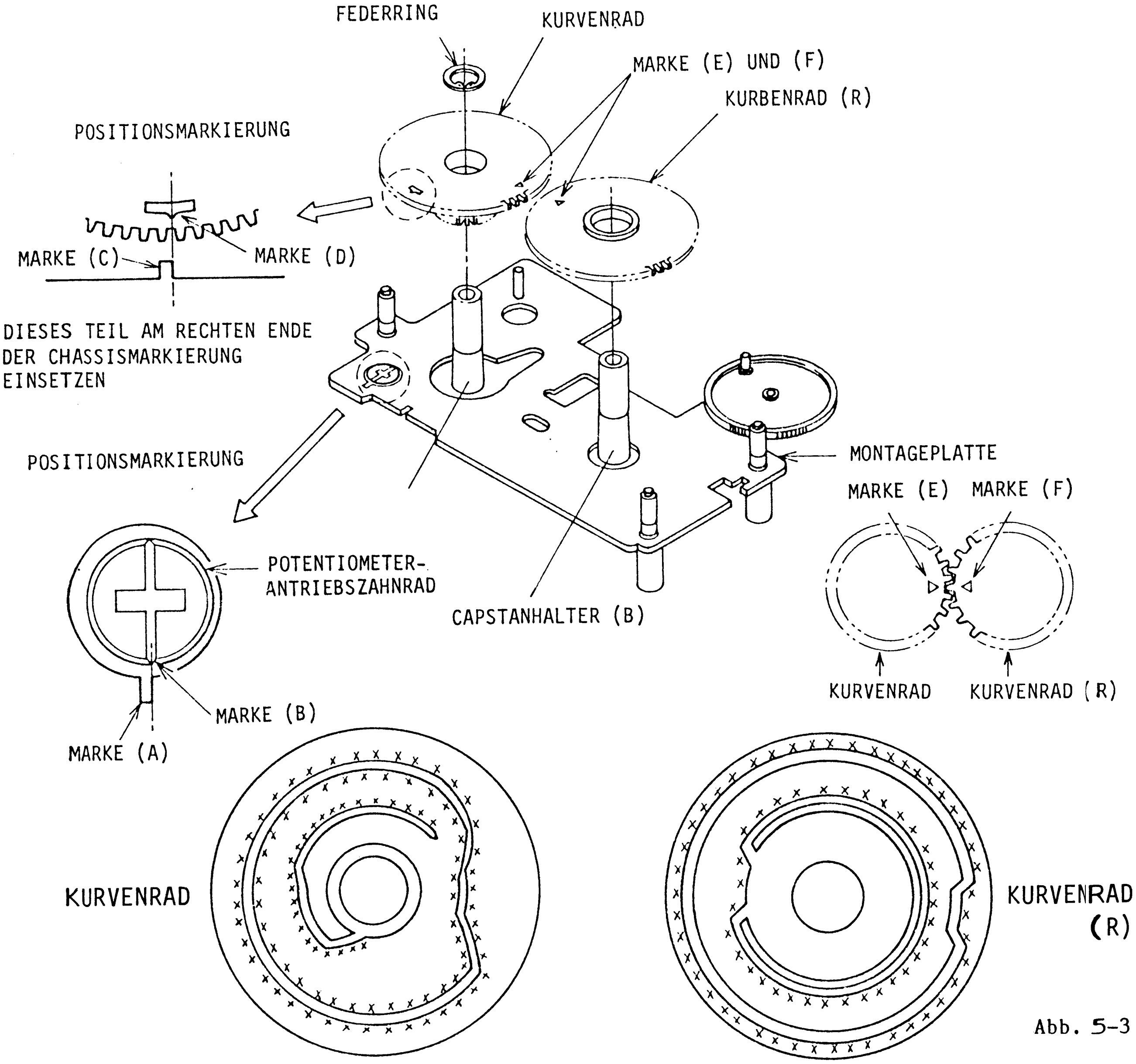
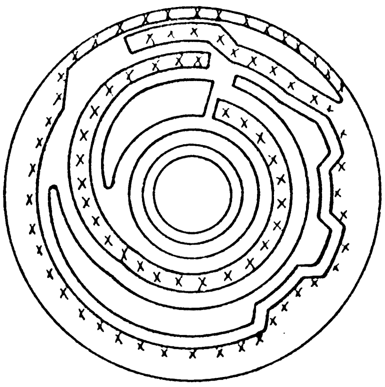

FEDERRING
KURVENRAD
MARKE (E) UND (F)
KURBENRAD (R)
POSITIONSMARKIERUNG
MARKE (C)
MARKE (D)
DIESES TEIL AM RECHTEN ENDE DER CHASSISMARKIERUNG EINSETZEN
POSITIONSMARKIERUNG
POTENTIOMETER-ANTRIEBSZAHNRAD
MARKE (B)
MARKE (A)
CAPSTANHALTER (B)
MONTAGEPLATTE
MARKE (E)
MARKE (F)
KURVENRAD
KURVENRAD (R)
KURVENRAD
KURVENRAD (R)

Abb. 5-3



1) Einstellung des Positionsreglers (Potentio-Antriebszahnrad)
   Das rechte Ende von Marke (A) wie in der Zeichnung gezeigt mit der Mitte von Marke (B) ausrichten. (Abb. 5-3 ①)
2) Auf die mit "X" markierten Teile Molybdän Schmiermittel auftragen. (Abb. 5-3 ②)
3) Das Kurvenrad auf dem Capstanhalter (A) anbringen. Wenn das Kurvenrad korrekt angebracht ist, stimmt die Mitte von Marke (D) mit dem rechten Ende von Marke (C) überein. (Abb. 5-3 ③)
4) Den Federring ind die Rille des Capstanhalters einsetzen.
5) Das Kurvenrad (R) auf dem Capstanhalter (B) anbringen. Wenn das Kurvenrad (R) korrekt positioniert ist, stimmt die Mitte von Marke (E) mit der Mitte von Marke (F) überein. (Abb. 5-3 ④)

5-4 ABGLEICH DER VORGEGEBENEN POTENTIOMETER-SPANNUNG (Siehe Abb. 5-4 bis 5-8)

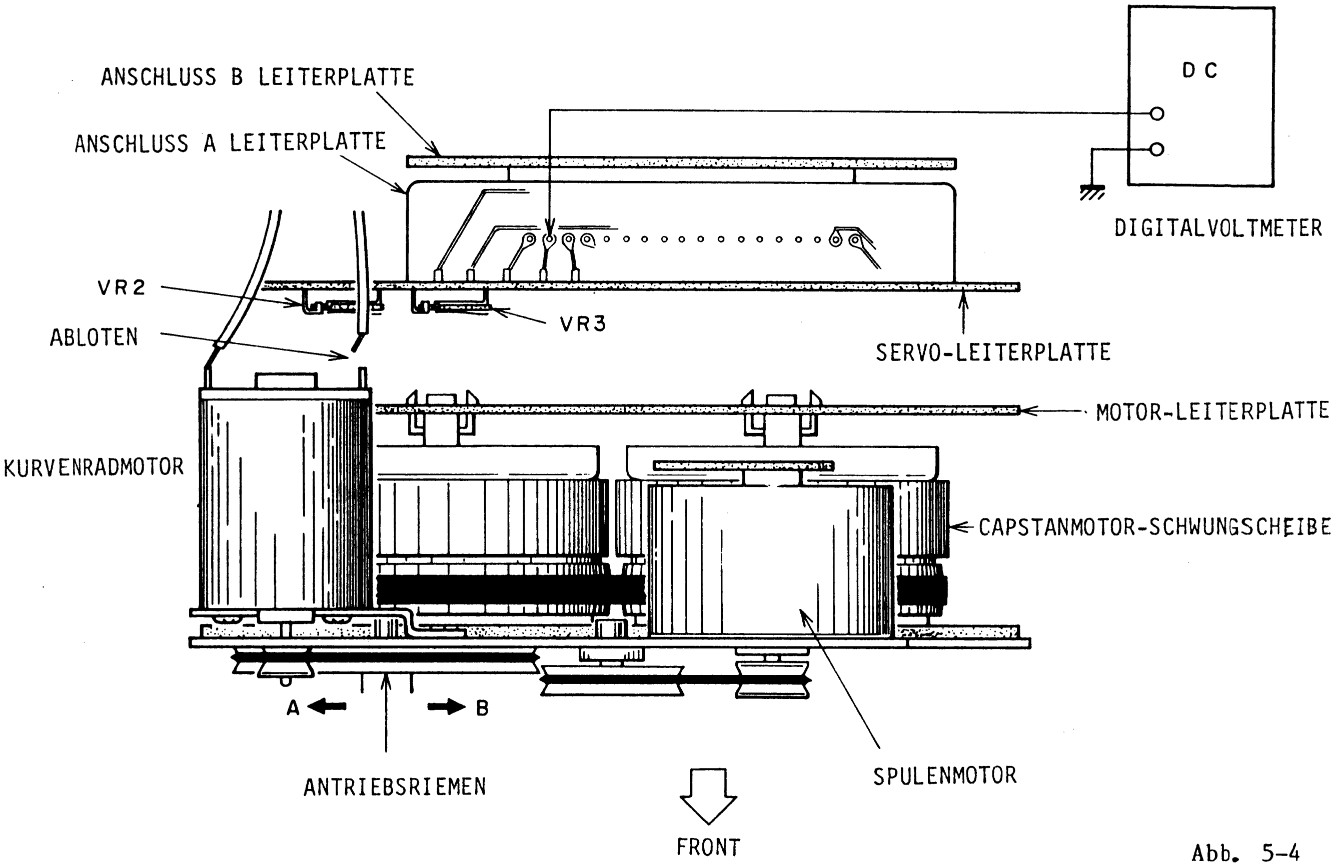

ANSCHLUSS B LEITERPLATTE
ANSCHLUSS A LEITERPLATTE
D C
DIGITALVOLTMETER
VR2
ABLOTEN
VR3
SERVO-LEITERPLATTE
MOTOR-LEITERPLATTE
KURVENRADMOTOR
CAPSTANMOTOR-SCHWUNGSCHEIBE
A
B
ANTRIEBSRIEMEN
SPULENMOTOR
FRONT

Abb. 5-4

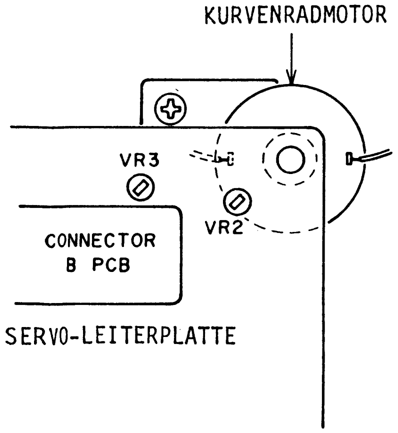

KURVENRADMOTOR
VR3
VR2
CONNECTOR
B PCB
SERVO-LEITERPLATTE

Abb. 5-5

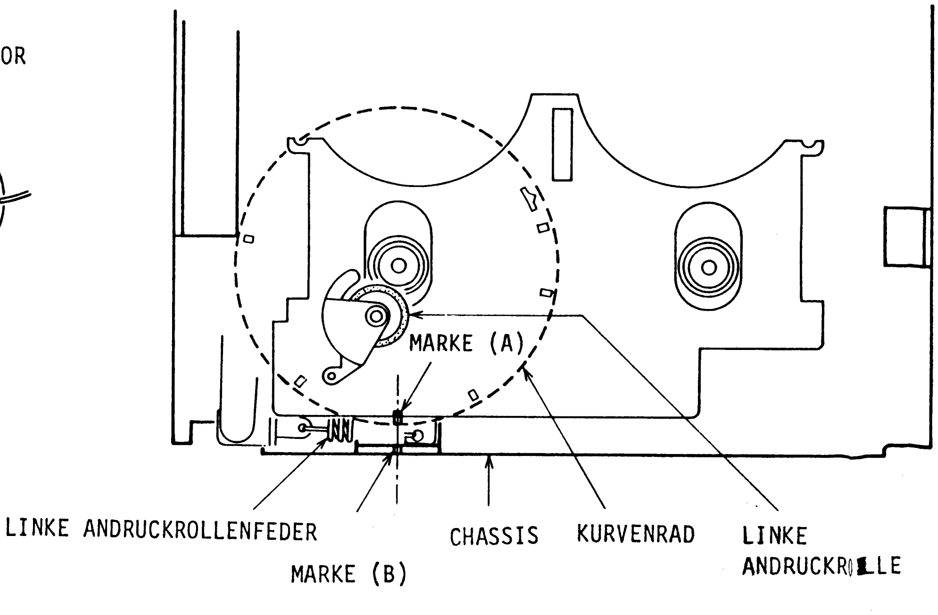

MARKE (A)
LINKE ANDRUCKROLLENFEDER
MARKE (B)
CHASSIS
KURVENRAD
LINKE
ANDRUCKROLLE

Abb. 5-6

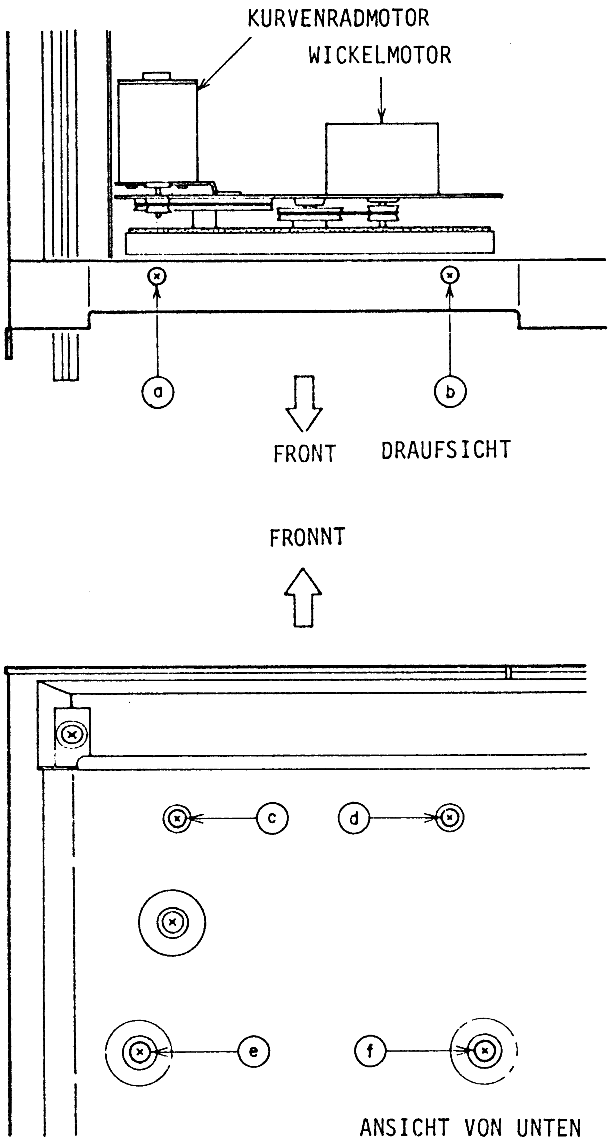


Abb. 5-7

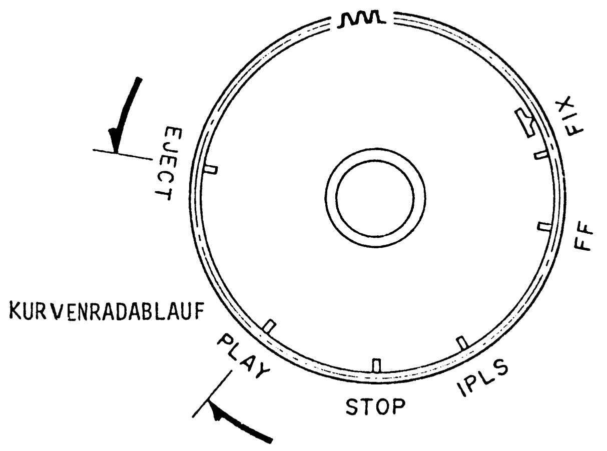


Abb. 5-8

1) ABGLEICH DER NIEDERSPANNUNG
(Siehe Abb. 5-4 und Abb. 5-5)
   a. Bei ausgeschalteter Stromversorgung das Anschlußkabel vom Kurvenradmotor ablöten und den Antriebsriemen mit dem Finger so weit wie möglich in Richtung A drehen.
   b. Das Digitalvoltmeter wie in Abb. 5-4 gezeigt anschließen.
   c. Bei eingeschaltetem Gerät VR3 so abgleichen, daß die abgelesene Spannung 1,255 ± 0,05 V beträgt.

2) ABGLEICH DER HÖCHSTASPANNUNG
(Siehe Abb. 5-4 und Abb. 5-5)
   a. Bei abgeschaltetem Gerät den Antriebsriemen mit den Fingern bis zum Anschlag in Richtung B drehen.
   b. Bei eingeschaltetem Gerät VR2 so einstellen, daß die abgelesene Spannung 9,22 ± 0,01 V beträgt.

3) Die Abschnitte 1) und 2) wiederholen.

4) a. Bei ausgeschalteter stromversorgung das Anschlußkabel des Motors anschließen.
   b. Das Digitalvoltmeter abtrennen.
   c. Die Schrauben ⓐ bis ⓕ in Abb. 5-6 entfernen und den gesamten Mechanikblock leicht herausziehen.

5) a. Das Gerät einschalten.
   b. VR2 etwas verstellen, so daß in der STOP-Betriebsart die Mitte der Marke (A) mit der Mitte der Marke (B) übereinstimmt (die Spannung in der STOP-Betriebsart beträgt ca. 7,35 V, wenn die Versorgungsspannung an ① in Abb. 5-4 9,75 V beträgt.)
   c. Den Cassettendeckel entfernen und mit dem AUTO SYSTEM-Schalter die IPLS-Betriebsart einschalten.
   d. Sicherstellen, daß bei abwechselndem Drücken der Vorlauf- und Rücklauftasten der Tonkopf nicht auf- und abbewegt wird.
   e. Mit den Fingern die Spule in der STOP-Betriebsart drehen, um sicherzustellen, daß die Bremse zufriedenstellend arbeitet.
   Wenn die Bremse normal funktioniert, dreht sich die Aufwickelspule nicht im Uhrzeigersinn und die Abwickelspule nicht gegen den Uhrzeigersinn.

5-5 EINSTELLUNG DER BANDGESCHWINDIGKEIT (Siehe Abb. 5-9)

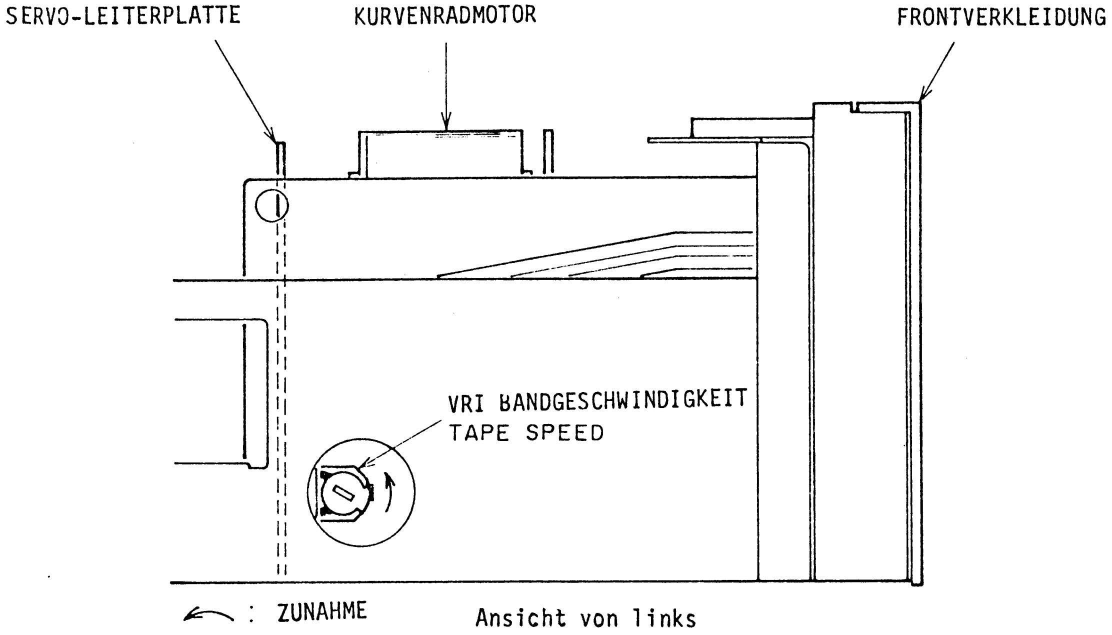

SERVO-LEITERPLATTE
KURVENRADMOTOR
FRONTVERKLEIDUNG
VRI BANDGESCHWINDIGKEIT
TAPE SPEED
: ZUNAHME
Ansicht von links

Abb. 5-9

Einen Frequenzzähler an die LIne-Ausgang anschließen. Eine bespielte 1000Hz-Testcassette (AT-750774) abspielen und den Bandgeschwindigkeits-Einstellregler(SERVO LEITERPLATTE) so einstellen, daß eine Frequenz von 995 bis 1005 Hz erreicht wird.

VI. TONKOPFEINSTELLUNG

6-1 EINSTELLUNG DER BANDFÜHRUNGSHÖHE (Siehe Abb. 6-1 und 6-2)

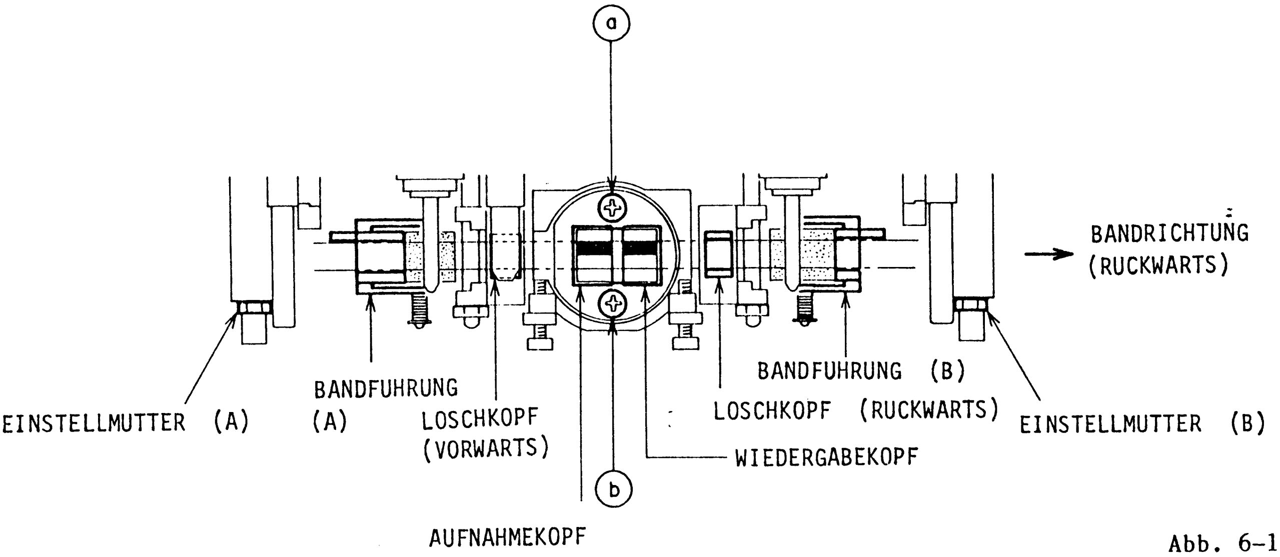

ⓐ
BANDRICHTUNG
→ (RUCKWARTS)
EINSTELLMUTTER (A)
BANDFUHRUNG (A)
LOSCHKOPF (VORWARTS)
ⓑ
AUFNAHMEKOPF
BANDFUHRUNG (B)
LOSCHKOPF (RUCKWARTS)
WIEDERGABEKOPF
EINSTELLMUTTER (B)

Abb. 6-1

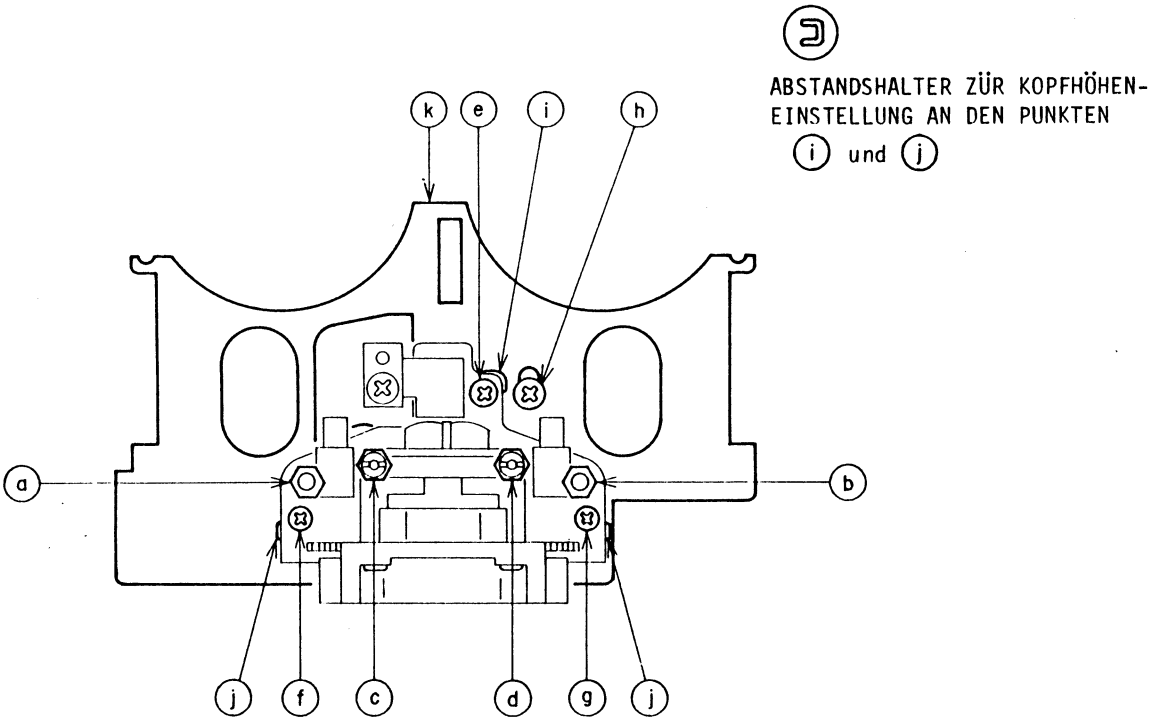

ⓙ
ABSTANDSHALTER ZÜR KOPFHÖHEN-
EINSTELLUNG AN DEN PUNKTEN
ⓘ und ⓙ
ⓚ
ⓔ
ⓘ
ⓗ
ⓐ
ⓑ
ⓙ
ⓕ
ⓒ
ⓓ
ⓖ
ⓙ

Abb. 6-2

6-1-1 Nach Austausch des Andruckrollenblocks

a) Eine Spiegelcassette (AJ-751178) einlegen.

b) Wenn nur der Andruckrollenblock (L) ausgetauscht worden ist, wählt man die Betriebsart FWD PLAY und stellt die Höhe der Bandführung (A) durch Drehen der Mutter (A) so ein, daß das Band am angrenzenden Rand beider Bandführungen reibungslos läuft und das Band keinerlei Verformungen aufweist.

c) Wenn nur der Andruckrollenblock (R) ausgetauscht wurde, wählt man die Betriebsart REV PLAY und stellt die Höhe der Bandführung (B) durch Drehen der Mutter (B) in der gleichen Weise wie im Abschnitt b) ein.

d) Nach der Einstellung Siegellack auf diese Muttern auftragen.

6-1-2 NACH AUSTAUSCH DES LÖSCHKOPFES (Siehe Abb. 6-1 und 6-2)

a) Eine 315 oder 333 Hz Wiedergabepegel-Einstellcassette (AT-750773) einlegen und die Betriebsart FWD PLAY wählen.
b) Die Löschkopfhöhe durch Drehen der Muttern ⓐ und ⓑ wie in Abb. 6-2 gezeigt so einstellen, daß der Line Out Pegel -5,5 dBm, 315 Hz bzw. -6,1 dBm, 333 Hz beträgt.
c) Die REV PLAY-Betriebsart wählen und die Löschkopfhöhe durch Drehen der Muttern ⓐ nd ⓑ nochmals einstell, so daß die Pegeldifferenz (linker Kanal) zwischen den Betriebsarten FWD und REV innerhalb ±0,5 dBm liegt.
d) Die Einstellungen der Abschnitte a), b) und c) wiederholen.
e) Eine Spiegelcassette (AJ-751178) einlegen und die Betriebsart FWD PLAY wählen.
f) Die Höhe der Bandführung (A) durch Drehen der Mutter (A) und die Höhe des Löschkopfes (REV) durch Drehen der Mutter (B) so einstellen, daß das Band ohne Verformung an den Bandführungskanten vorbeiläuft.
g) Als nächstes die Betriebsart REV PLAY währlen und die Höhe der Bandführung (B) durch Drehen der Mutter (B) so einstellen, daß das Band ohne Verformung glatt über die angrenzenden Ränder beider Löschköpfe (FWD und REV) läuft.
h) Sicherstellen, daß der Line-Ausgangspegel (linker Kanal) -5,5 dBm und die Pegeldifferenz (linker Kanal) zwischen den Betriebsarten FWD und REV innerhalb von ±0,5 dBm liegt.

6-2 KOMBIKOPF-AZIMUTH-EINSTELLUNG (Siehe Abb. 6-2)

Eine 10kHz-Kopf Azimuth-Einstellcassette (AT-750778) wiedergeben und die Schrauben ⓒ (FWD-Richtung) und ⓓ (REV-Richtung) so einstellen, daß die Pegel beider Kanäle Maximum betragen.
(Hinweis: Die Schrauben nicht zu weit drehen, da andere (falsche) Maximalwerte weiter entfernt auf beiden Seiten der korrekten Position existieren.)

6-3 EINSTELLUNG DER KOPFHÖHE (Siehe Abb. 6-1 und 6-2)

Diese Einstellung ist nicht erforderlich, da dieses Modell GX-R 88 mit einem rotierenden Kopfsystem (mit Aufnahme- und Wiedergabe-Kombikopf) ausgestattet ist. Die Überprüfung der korrekten Kopfhöhe ist jedoch erforderlich und wird wie folgt ausgeführt:

1) Sicherstellen, daß der Azimuth nach Abschnitt 6-2 korrekt ist.
2) Eine 315 Hz (oder 333 Hz) Wiedergabepegel-Einstellcassette (AT-750773) in der FWD Wiedergabe-Betriebsart abspielen und den Wiedergabepegel-Einsteller (VR5 an der Vorverstärker-Leiterplatte) so einstellen, daß der LINE OUT-Pegel des linken Kanals -5,5 dBm beträgt.
Danach den Pegel des gleichen Kanals in der REV-Betriebsart überprüfen.
Die Pegeldifferenz zwischen der FWD und der REV-Betriebsart sollte sich innerhalb ±0,5 dBm bewegen.
3) Wenn im Abschnitt 2 die Differenz mehr als ±0,5 dBm beträgt, werden die Löschköpfe durch Drehen beider Löschkopfhöhen-Einstellschrauben Ⓐ und Ⓑ in der gleichen Richtung um 1/4 Drehung (±0,1 mm) so eingestellt, daß die Differenz innerhalb ±0,5 dBm liegt.
4) Wenn durch Vornahme der obigen Einstellung die Differenz nicht korrigiert werden kann, ist eine Kopfhöhen-Einstellung erforderlich. Dies kann durch Auswechseln der Abstandshalter zur Einstellung der Kopfhöhe ⓘ und ⓙ vorgenommen werden (die Dicke dieser Abstandshalter beträgt ⓘ = 0,45 mm, ⓙ = 0,35 mm). Zum Austausch der Abstandshalter sind die Schrauben ⓔ ⓕ und ⓖ lösen. Wenn der Pegel in der REV-Betriebsart niedriger ist, bedeutet dies, daß der Kopf zu hoch ist, in diesem Falle sind die Abstandshalter gegen dünnere auszutauschen. Wenn der Pegel in der REV-Betriebsart höher ist, sind die Abstandshalter gegen dickere auszutauschen.
Nach dem Austausch dieser Abstandshalter ist die gleiche Einstellung in Abschnitt 1) vorzunehmen und sicherzustellen, daß der Pegel von LINE OUT -5,5 dBm ± 0,5 dBm beträgt.
Ferner zur Überprüfung eine 4-Spur-Kopfhöhen Einstellcassette (1 kHz/ 4 Spur, AT-750775) abspielen. Der LINE-Ausgangspegel beider Kanäle sollte mehr als -8 dBm betragen und die Pegeldifferenz zwischen den Betriebsarten FWD und REV sollte innerhalb ±1 dBm liegen. Andernfalls ist die Feineinstellung in der gleichen Weise vorzunehmen wie im Abschnitt 3) und 4).
5) Ist ein Austausch des Kopfes erforderlich, löst man nur die Schrauben ⓐ und ⓑ in Abb. 6-1.

6-4 EINSTELLUNG DES KOPFBLOCK-VORSPRUNGS

Eine Tonkopfvorsprungs-Meßvorrichtung (AT-751180) verwenden und die Wiedergabebetriebsart FWD oder REV wählen.
Die Schraube ⓗ lösen und das Kopfträgerchassis ⓚ so einstellen, daß das Meßgerät 3,1 ± 0,15 mm anzeigt. Nach der Einstellung Siegellack auf die Schraube ⓗ auftragen.

HINWEIS:
1. Vor der Kopfeinstellung auf jeden Fall die Köpfe reinigen.
2. Darauf achten, daß keine magnetischen Schraubenzieher oder sonstige magnetische Werkzeuge in der Umgebung der Köpfe verwendet werden.
3. Vor und nach der Kopfeinstellung auf jeden Fall die Tonköpfe mit einer Entmagnetisierungsdrossel entomagnetisieren.

VII. ELEKTRISCHER ABGLEICH

7-1 ABGLEICH DER VORVERSTÄRKER-LEITERPLATTE

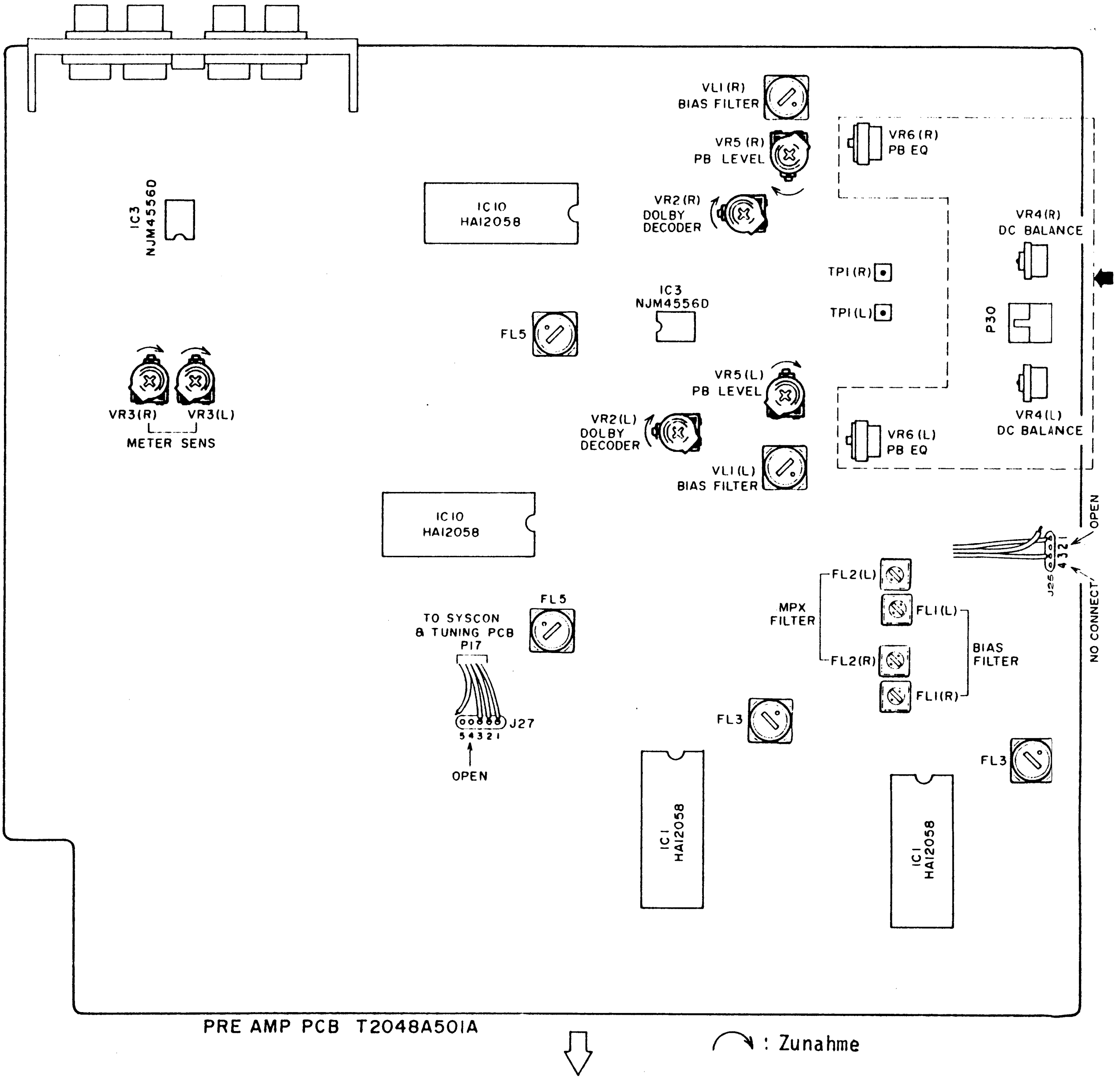
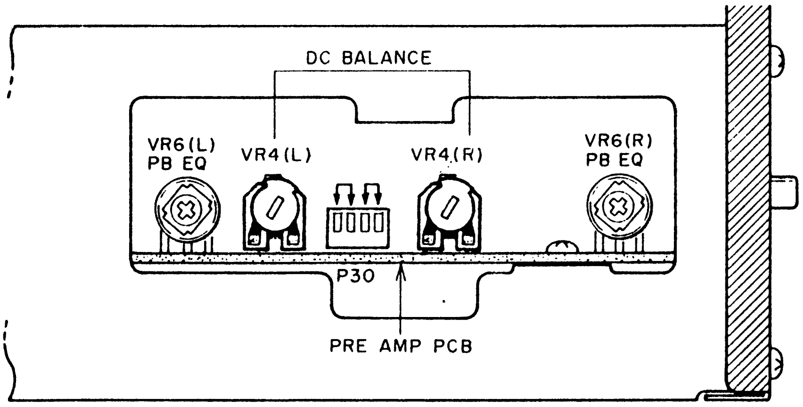

VL1(R)
BIAS FILTER
VR5(R)
PB LEVEL
VR6(R)
PB EQ
VR2(R)
DOLBY
DECODER
VR4(R)
DC BALANCE
IC3
NJM4556D
IC10
HA12058
TP1(R)
TP1(L)
A
P30
FL5
VR5(L)
PB LEVEL
VR4(L)
DC BALANCE
VR3(R)
VR3(L)
METER SENS
VR2(L)
DOLBY
DECODER
VR6(L)
PB EQ
VL1(L)
BIAS FILTER
OPEN
4 3 2 1
J25
NO CONNECT
FL2(L)
MPX
FILTER
FL1(L)
BIAS
FILTER
FL2(R)
FL1(R)
TO SYSCON
& TUNING PCB
P17
J27
5 4 3 2 1
OPEN
FL3
IC1
HA12058
PRE AMP PCB T2048A501A
FRONT
: Zunahme

Abb. 7-1 Vorverstärker-Leiterplatte


DC BALANCE
VR6(L)
PB EQ
VR4(L)
VR4(R)
VR6(R)
PB EQ
P30
PRE AMP PCB

ANSICHT VON A

Abb. 7-2

VORVERSTÄRKER-ABGLEICH ÜBERSICHT
(für weitere Einzelheiten, Siehe 7-1-1 bis 7-1-3)

Schritt	Abgleich-gegenstand	Betriebs-art	Testcassette und angelegtes Signal	Abgleich-punkt	Ergebnis
1	DC Balance	STOP	Connect INPUT PIN of P30 with GND	VR4(L) VR4(R)	TP1(L) TP1(R) 0±100mV D.C
2	P.B Level	FWD PLAY	333Hz 0 VU Tape (315Hz 0 VU Tape)	VR5(L) VR5(R)	LINE OUT -6,1±0,1dBm (-5,5±0,1dBm)
		REV PLAY	333Hz 0 VU Tape (315Hz 0 VU Tape)	Überprüfung	
3	P.B EQ	FWD PLAY	10 kHz P.B EQ Tape	VR6(L) VR6(R)	LINE OUT -20,5±0,2dBm
		REV PLAY	10 kHz P.B EQ Tape	Überprüfung	-20,5±2,0dBm
4	ANZEIGE-Empfindlichkeit	TAPE MONITOR SOURCE	1 kHz LINE IN (-5,2 dBm LINE OUT)	VR3(L) VR3(R)	+1 VU Anzeige auf dem VU METER
5	Dolby Decoder	FWD PLAY	315Hz 0 VU Tape (333Hz 0 VU Tape)	VR2(L) VR2(R)	LINE OUT -5,5±0,3dBm mit Dolby (-6,1±0,3dBm)
6	MPX Filter REC		19 kHz LINE IN	FL2(L) FL2(R)	LINE OUT MIN
7	BIAS Filter (Source)	REC/PLAY REC/PAUSE	Ohne Signal Reineisenband (REC VR MAX)	FL1(L) FL1(R)	LINE OUT MIN
8	BIAS Filter (P.B)	REC/PLAY	Ohne Signal Reineisenband	VL1(L) VL1(R)	LINE OUT MIN

7-1-1 ABGLEICH DES WIEDERGABEENTZERRERVERSTÄRKERS (TUNING-LEITERPLATTE ist von der ANZEIGE-LEITERPLATTE abtrennbar)

1) DC Balance
   a. Den Anschlußstecker von P30 entfernen (WIEDERGABEKOPF-Anschlußstecker)
   b. Den INPUT SIGNAL PIN (Eingangssinalstift) von P30 Stift ①, ④ an Masse anschließen.
   c. VR4 so einstellen, daß die Spannung von TP1 0 ± 100mV-Gleichspannung beträgt.
2) Wiedergabepegel
   a. Mit FWD eine 333Hz-Wiedergabe-Einstellcassette (AT-750773) oder eine 315Hz-Wiedergabe-Einstellcassette (AT-750773) abspielen und VR5 einstellen, daß der LINE OUT-Pegel bei 333 Hz -6,1 ± 0,1 dBm bzw. bei 315 Hz -5,5 ± 0,1 dBm beträgt.
   b. Mit REV Wiedergabe eine 333 Hz oder 315Hz-Wiedergabepegel-Einstellcassette abspielen und sicherstellen, daß der LINE OUT-Pegel -6,1 ± 0,6 dBm (333 Hz) bzw. -5,5 ± 0,6 dBm (315 Hz) beträgt.
3) Wiedergabeentzerrung
   a. Eine 10kHz-Wiedergabeentzerrungs-Einstellcassette (AT-750778) im FWD-Richtung abspielen und VR6 so einstellen, daß der LINE OUT-Pegel -20,5 ± 0,2 dBm beträgt.
   b. Eine 10kHz-Wiedergabeentzerrungs-Einstellcassette in REV-Richtung abspielen und sicherstellen, daß der LINE OUT-Pegel -20,5 ± 2,0 dBm beträgt.

7-1-2 ABGLEICH DER ANZEIGEEMPFINDLICHKEIT

a. Den Monitorschalter auf SOURCE und den Anzeigeunschalter auf VU ein 1 kHz-Signal an LINE IN und ein 1 kHz-Signal -5,2 dBm an LINE OUT -5,2 dBm an LINE OUT anlegen.

b. VR3 so abgleichen, daß +1 VU erreicht wird.

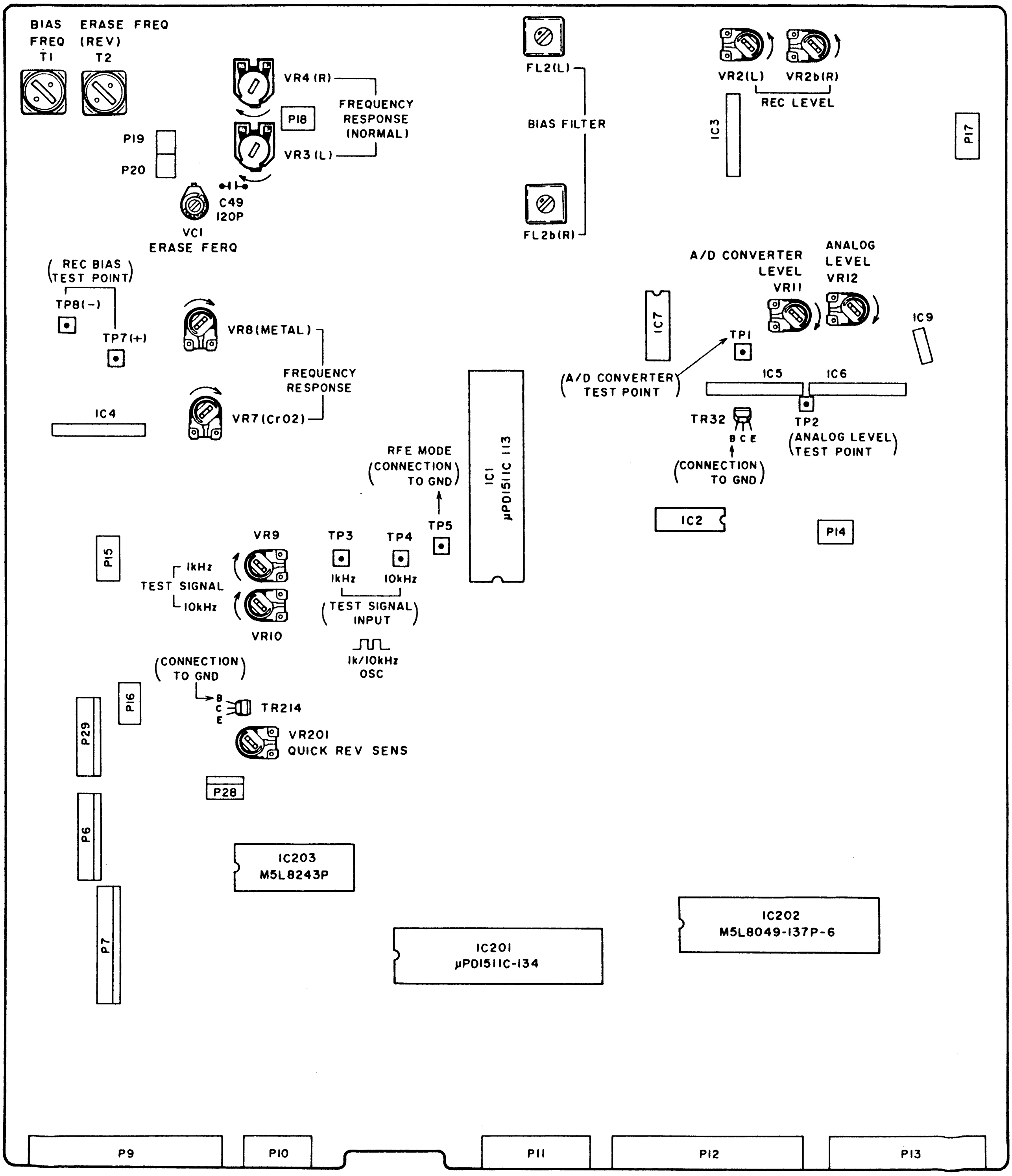
7-1-3 DOLBY-ABGLEICH

1) Dolby-Decoder-Abgleich
   a. Eine 315Hz-Wiedergabepegel-Einstellcassette (AT-750773) abspielen.
   b. VR2 so abgleichen, daß der LINE OUT-Pegel bei Dolby EIN -5,5 ± 0,3 dBm beträgt. (Bei Verwendung der 333Hz-Wiedergabepegel-Einstellcassette beträgt der LINE OUT-Pegel -6,1 ± 0,3 dBm.

2) MPX-Filter-Abgleich
   a. Eine Leercassette einlegen und die REC/PLAY-Betriebsart einschalten.
   b. Mit dem MPX-Filter-Schalter in der AUS-Stellung ein 19kHz-Signal über LINE IN anlegen.
   c. FL2 so abgleichen, daß der LINE OUT-Pegel Minimum beträgt, wenn der MPX-Filterschalter eingeschaltet wird.

3) BIAS-Filterabgleich
   a. Eine Reineisenband-Cassette einlegen und die REC/PLAY-Betriebsart einschalten (bzw. REC/PLAY → REC/PAUSE).
   b..FL1 so abgleichen, daß der LINE OUT-Pegel Minimum beträgt, wenn die Aussteuerung auf MAX eingestellt ist und der Monitorschalter auf SOURCE steht.
   c. Eine Reineisenband-Cassette einlegen und die REC PLAY-Betriebsart einschalten.
   d. VL1 so abgleichen, daß der LINE OUT-Pegel Minimum beträgt, wenn der Monitorschalter auf TAPE gestellt wird.

7-2 EINMESS-ABGLEICHPUNKTE


BIAS FREQ T1
ERASE FREQ (REV) T2
VR4 (R)
VR3 (L)
FREQUENCY RESPONSE (NORMAL)
P18
P19
P20
C49 120P
VC1 ERASE FERQ
FL2(L)
BIAS FILTER
FL2b(R)
VR2(L)
VR2b(R)
REC LEVEL
IC3
P17
(REC BIAS TEST POINT)
TP8(-)
TP7(+)
VR8(METAL)
VR7(CrO2)
FREQUENCY RESPONSE
IC4
A/D CONVERTER LEVEL VR11
ANALOG LEVEL VR12
IC7
TP1
(A/D CONVERTER TEST POINT)
IC9
IC5
IC6
TP2
(ANALOG LEVEL TEST POINT)
TR32
B C E
(CONNECTION TO GND)
IC1 µPD1511C 113
RFE MODE (CONNECTION TO GND)
TP5
IC2
P14
P15
VR9
1kHz TEST SIGNAL 10kHz
VR10
TP3
TP4
1kHz
10kHz
(TEST SIGNAL INPUT)
1k/10kHz OSC
(CONNECTION TO GND)
B C E
TR214
VR201 QUICK REV SENS
P16
P29
P28
P6
P7
IC203 M5L8243P
IC201 µPD1511C-134
IC202 M5L8049-137P-6
P9
P10
P11
P12
P13

ANSICHT VON DER BESTUCKUNGSSEITE

FRONT

↷ : ZUNAHME

Abb. 7-3 Sys-con und Einmeß-Leiterplatte

EINMESS-ABGLEICH-TABELLE

(Für weitere Einzelheiten, siehe 7-2-1 bis 7-2-7)

Alle, die Aufnahme betreffenden Abgleicharbeiten, müssen in dieser REF-Betriebsart ausgeführt werden.
Die REF-Betriebsart erhält man, indem TP5 auf der Einmeß-Leiterplatte innerhalb 3 Sekunden nach Einschalten des Gerätes geerdet wird. (Siehe Hinweis 3)

Schritt	Abgleich-gegenstand	Betriebsart	Testcassette und angelegts Signal	Abgleich-punkt	Ergebnis	Bemerkungen
1	Erase OSC	REV REC REC PAUSE	METAL TAPE	T2	100±0,2kHz	Anschluß des Zählers an P19
		FWD REC REC PAUSE	METAL TAPE	VC1	100±1kHz	Anschluß des Zählers an P20
2	Rec Bias OSC	FWD REC REC PAUSE	METAL TAPE	T1	MINIMUM DC VOLTAGE	Zwischen TP7 (+) und TP8(-)
3	Freq Response (Norm)	FWD REC/PB	NORMAL TAPE 1kHz, 10kHz -25,5dBm	VR4(L) VR3(R)	1kHz to 10 kHz FLAT	
		REV REC/PB	Gleich wie FWD			Überprüfung
	(CrO_2)	FWD REC/PB	CrO_2 TAPE 1kHz, 10kHz -25,5dBm	VR5	1kHz to 10 kHz FLAT	
		REV REC/PB	Gleich wie FWD			Überprüfung
	(Metal)	FWD REC/PB	METAL TAPE 1kHz, 10kHz -25,5dBm	VR6	1kHz to 10 kHz FLAT	
		REV REC/PB	Gleich wie FWD			Überprüfung
4	Recording Level	FWD REC/PB	NORMAL TAPE 1kHz -5,5dBm	VR1(L) VR2(R)	-5,5±0,2dBm	
		REV REC/PB	Gleich wie FWD		FWD RESULT ±0,5dBm	
5	A/D Converter	FWD REC PAUS		VR11	3,0±0,05 V DC	Anschluß des Digitalvoltmeters an TP1
6	Analog Level		10kHz -25,5±0,2dBm to J27- 4	VR12	3,0±0,05 V DC	J27- 4 ablöten, B von TR32 erden.
7	Test Signal (1kHz, 10kHz)	TAPE MONITOR SOURCE	SQUARE WAVE 1kHz, 1 to 2V to TP3	VR9	-26,5±0,2 dBm	LINE OUT
			SQUARE WAVE 10kHz, 1 to 2V to TP4	VR10	-26,5±0,2 dBm	LINE OUT
			2 bis 3 mal wiederholen, so daß in Schritt 7 nahezu gleiches Resultat erreicht wird.			

HINWEIS:

1. Zur Messung folgende Kassettentypen verwenden:
   Normalband: Maxell UD C-60
   CrO2-Band: TDK SA C-60
   Reineisenband : TDK MA C-60
2. a. Für den Vorverstärker-Abgleich, siehe Abb. 7-1 und 7-2.
   b. Für den Einmeß-Abgleich, siehe Abb. 7-3.
3. Besondere Hinweise bei der REF-Betriebsart
   a. Die REF-Betriebsart kann nur durch Ausschalten des Gerätes aufgehoben werden.
   b. In der REC-Betriebsart leuchtet nur die REC-Anzeige (nicht die TUNING-Anzeige) auf.
   c. Das Eingangssignal wird in der REF-Betriebsart stummgeschaltet, falls J25 Stift ② nicht abgetrennt wird.

7-2-1 LÖSCH-OSC-ABGLEICH

a. Ein Reineisenband einlegen und die REV REC/PLAY-Betriebsart einschalten.

b. Den Frequenzzähler an T19 (Einmeß-Leiterplatte) anschließen und T2 so abgleichen, daß die Frequenz 100 ± 0,2 kHz beträgt.

c. Den Frequenzzähler an P20 (Einmeß-Leiterplatte) anschließen und VC1 so abgleichen, daß die Frequenz 100 ± 1 kHz beträgt. Wird dieses Ergebnis nicht erreicht, muß C49 (120P) ausgelötet und VC1 nochmals abgeglichen werden, um diesen Wert zu erhalten.

7-2-2 ABGLEICH DER VORMAGNETISERUNG

a. Ein Gleichspannungsvoltmeter an TP7(+) und TP8(-) anschließen und T1 auf Spannungsminimum abgleichen.

7-2-3 EINSTELLUNG DES FREQUENZGANGS

a. Eine FWD-Aufnahme und Wiedergabe mit 1 kHz/10 kHz, -25,5 dBm auf Normalband machen. VR4 (linker Kanal) und VR3 (rechter Kanal) so einstellen, daß gleicher Pegel bei beiden Frequenzen erzielt wird. Der Unterschied zwischen beiden Kanälen sollte höchstens 0,5 dBm betragen.

b. Unter gleichen Bedingungen wie in a. erläutert eine FWD-Aufnahme und Wiedergabe auf CrO2 Band machen und mit VR5 auf gleichen Pegel einstellen.

c. Reineisenband wird unter den gleichen Bedingungen wie in a. beschrieben mit VR6 eingestellt.

d. Der REF-Betrieb ist mit allen 3 Bandsorten zu überprüfen.

7-2-4 AUFNAHMEPEGEL-ABGLEICH

a. Eine FWD-Aufnahme und Wiedergabe mit 1 kHz, -5,5 dBm machen und VR2 so abgleichen, daß die Differenz zwischen Aufnahme- und Wiedergabepegel 0 ± 0,2 dBm beträgt.

b. Überprüfen, daß die Differenz zwischen FWD und REV innerhalb 0,5 dBm liegt.

7-2-5 ABGLEICH DES A/D-UMSETZERS

a. Die REC/PAUSE-Betriebsart einschalten.

b. VR11 so abgleichen, daß die Spannung am TP1 nach Masse 3 ± 0,05 V Gleichspannung beträgt.

7-2-6 ABGLEICH DES ANALOGPEGELS

a. Den an J27 ④ der Vorverstärker-Leiterplatte angelöteten Draht ablöten. (Siehe Abb. 7-1) (Der Draht ist Rc PB out).

b. Die Basis von TR32, die Rückseite von R137 oder die linke Seite von R138 mit Masse verbinden.

c. 10 kHz, -25,5 ± 0,2 dBm an den PB out (rechter Kanal) Anschluß ④ anlegen. Die Eingangsspannung zwischen den Anschlüssen nach Masse messen. (-25 ± 0,2 dBm)

d. VR12 so abgleichen, daß die Spannung am TP2 gegen Masse 3 ± 0,05 V Gleichspannung beträgt.

7-2-7 ABGLEICH TESTSIGNALPEGEL

a. Den an J25 ② der Vorverstärker-Leiterplatte angelöteten Draht, ablöten. (Siehe Abb. 7-1)

b. Monitor-Schalter auf SOURCE stellen.

c. Ein 1 kHz Rechtecksignal von 1 bis 2 V an TP3 anlegen. Der Eingangsspannungspegel ist mit dem Oszilloskop zu messen.

d. VR9 so abgleichen, daß der LINE OUT-Pegel -26,5 ± 0,2 dBm beträgt.

e. Danach das Rechtecksignal von TP3 an TP4 anschließen.

f. VR10 so abgleichen, daß der LINE OUT-Pegel -26,5 ± 0,2 dBm beträgt.

g. Diesen Einstellvorgang 2 bis 3 mal wiederholen, bis gleicher Pegel erreicht wird.

7-3 EINSTELLUNG DER QUICK-REVERSE-EMPFINDLICHKEIT
(Siehe Abb. 7-4)

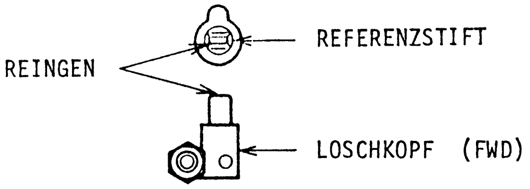


Abb. 7-4

a) Durch Entnahme des Bandes aus dem Cassettengehäuse, eine bandlose Cassette herstellen.
b) Das Digitalvoltmeter zwischen der Basis von TR214 und Masse anschließen.
c) Unter Verwendung der bandlosen Cassette VR201 (an der SYS-CON LEITERPLATTE, siehe Abb. 7-3) so einstellen, daß das Digitalvoltmeter in der FWD Wiedergabe 4,30 ± 0,05V-Gleichspannung anzeigt.

HINWEIS: Vor dieser Einstellung den Referenzstift und den Löschkopf (FWD-Seite) reinigen. (Siehe Abb. 7-4)